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HYGEIA

THE HEALTH MAGAZINE

PUB. BY THE AMERICAN MEDICAL ASSOCIATION

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JULY 1930

Dad Comes Home Late

Painful Feet

Fasting

Ernest Sommers Jr.

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HYGEIA, the Health Magazine, is published monthly by the American Medical Association, 535 North Dearborn Street, Chicago, Ill. Yearly subscription price, $3.00; for foreign postage add 50 cents. Volume 8, Number 7. Entered as second-class matter March 21, 1923, at the postoffice at Chicago, Ill., under the Acts of March 3, 1879. Acceptance for mailing at special rate of postage provided for in Section 1,103, Act of October 3, 1917, authorized March 21, 19[illegible]

HYGEIA

THE HEALTH MAGAZINE

Published by the American Medical Association
Edited by Morris Fishbein, M.D.

VOLUME 8 — JULY, 1930 — NUMBER 7

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Contributors to This Issue

SERGIUS MORGULIS, PH.D., was born in Russia and is now professor of biochemistry at the University of Nebraska. His article was presented as an address before a congress on gastro-intestinal and metabolic diseases in Amsterdam, Holland. DR. HENRY PLEASANTS, JR., will be remembered as the author of a recent article on preseason football training.

WILLIAM M. GARDNER, D.D.S., who has written many articles on the teeth for HYGEIA, is now assistant professor of preventive dentistry at Western Reserve University, Cleveland. ELVA E. CRONK is a dietitian connected with a large hospital in Florida. EMMA VIEDY, author of "Eyes for Ears," lives in Columbus, Ohio.

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CHARLOTTE F. KETT since 1925 has had charge of an editorial service for Junior Red Cross magazines of all countries. Her headquarters are in the Junior Red Cross Division of the League of Red Cross Societies in Paris. MRS. MYRTLE MEYER ELDRED is the author of many articles about children, including a syndicated feature.

DR. N. P. COLWELL is secretary of the Council on Medical Education and Hospitals of the American Medical Association. DR. THURMAN B. RICE, professor of preventive medicine in a midwestern medical school, writes this month the second article of a series showing the effects of physical defects on character. DR. B. C. H. HARVEY'S series will probably continue through the present year, after which it will appear in book form.

J. MACE ANDRESS, PH.D., and MRS. ANDRESS, who wrote this month's story for children, are now on their way to Europe. The school department will appear as usual, however, Dr. Andress having prepared it before sailing. IDA SPAETH is well loved by child readers of HYGEIA for her many health stories. Formerly a nurse, she is now a health librarian.

Published monthly by the American Medical Association, 535 North Dearborn Street, Chicago. Subscription price $3 a year. Single copies 25 cents. Foreign subscriptions $3.50 a year.

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CAMPS

An Editorial

THE summer camp has become a fixture in modern life. The moment school is ended, parents begin to cast about with a view to finding places in the out-of-doors where boys and girls of adolescent years may spend one or two months or even one or two weeks in recreation accompanied by instruction. The discipline and the social contacts of camp life and, on the other hand, the advantages to parents of being temporarily separated from the problems of the growing child are factors that have been responsible for the popularity of the summer camp. Already thousands of such camps have been established in various parts of the country. They exploit their particular advantages in various mediums of publication, by lectures, by circulars and especially by testimonials and recommendations.

IN THE selection of a summer camp, the parent should ascertain whether or not the camp supplies sanitary conditions, food, medical attention and social conditions at least as good as those that the child has at home. The health hazards that have been observed in some camps include improper disposal of sewage; failure to provide safe milk, fresh fruits and vegetables; uncontrolled dust; crowding; possibility of fire through the use of oil lamps attached to wooden shacks; lack of mosquito netting, and perhaps multiplication of activities to the point at which the children become fatigued and even exhausted.

From this brief and quite incomplete consideration of the possible dangers of camp life, it is obvious that parents should inform themselves fully concerning the curriculum of the camp, the amount of work expected of the child and the problems of sanitation that have been mentioned. In a few states health officials have included the camps in their purview. By means of regular inspection, they assure themselves that the laws of the state are having full compliance. In the vast majority of states, however, there are no laws regulating the camps, and appropriations are not made for necessary inspectors even if the laws give the health officials full authority. The camps are, moreover, at considerable distance from the city and are likely to be overlooked unless some official study is made a matter of routine.

OF THE thousands of camps already established a minimum percentage provide an infirmary for children who fall ill and a still smaller percentage have available a registered nurse or a physician. Reports from camps show that children have had broken arms and legs, appendicitis, meningitis or infectious diseases and have not had proper attention promptly. Delays have often proved serious or even fatal. Here is a question with which parents should concern themselves before selecting a camp for their child.

It is typical of American life that we constantly develop new inventions, new games and new methods of living and that we try them out before we ascertain their actual value or their detriment to human health and life. The development of the summer camp has been perhaps another demonstration of this nature. Accurate statistics do not seem to be available to prove the advantages of all of the camps for health building or for any other purpose. The experiment has been a mass experiment from which the general impression is good. If the records of hundreds of camps with various types of conditions could be assembled it might be possible to determine how much good or how much harm they have wrought. In the meantime, the caution would seem to be well worth emphasizing again that parents investigate and rate the camp according to the many factors that are fundamental in protecting the child against preventable disease.

Fasting and the Healing Art

by

Sergius Morgulis

In Japan there are temples to which pilgrims retire to fast for days and weeks on end to purify their souls and to regain lost health.

THE man in the street is still swayed largely by two prejudices in regard to fasting. He either swallows whole the fables about "fasting girls" or similar nonsensical tales of human beings abstaining from nourishment presumably for months or even years; or he is tormented by ghastly fear lest his existence be seriously jeopardized by a failure of his customary ration for a few days.

In either event, of course, such a person is victimized through lack of physiologic knowledge, which, on the one hand, lends color to the rankest exaggerations and, on the other hand, gives trust to gross underestimation of the human capacity for endurance. As a matter of thoroughly tested experience even so highly constituted an organism as the human being can live without food for a relatively long time, without injury to his body. Nay, under certain circumstances a person may actually benefit by the abstinence.

An organism while it fasts merely subsists on the nutriment contained in the deposits present in its own tissues. Naturally, one cannot fast indefinitely since these deposits are not inexhaustible. In other words, in the absence of food, life will persist as long as the reserve capital of the organism, represented by the tissue deposits, will last, and in some instances it may persist for a surprisingly long time.

It is not uncommon for devotees of certain religious sects to abstain from nourishment for periods up to a month without their health being thereby undermined. In Japan there are temples to which pilgrims retire to pray and to fast for days and weeks on end, to purify their souls and to regain lost health. It may also be recalled that McSwiney, the brave Mayor of Cork, protested against his imprisonment by a hunger strike and died after he had presumably fasted seventy-five days. This is the longest record known of a fast before fatal termination, though one cannot repose complete confidence in it since we have no knowledge to what extent McSwiney's jailers resorted to forcible feeding, which in any event would have tended to prolong his endurance. Nevertheless, this case illustrates in a dramatic manner the ability of the human organism to survive lack of nourishment. Of course, among the lower animals with a much simpler physiologic organization starvation is tolerated to a truly amazing degree, and survival for one or even two years is not a rare occurrence.

At first sight it seems entirely reasonable that an organism should survive fasting as long as its tissue supplies of nutrient substance hold out. Strictly speaking, however, this is not true. Animals generally die before the reserves of nourishment contained in their body have been completely exhausted. This is an interesting and important fact, which will be discussed more fully later. It suggests a thought, however, that should be emphasized here: that death from starvation is really not an exhaustion death. This in turn would imply that during fasting some process must be going on in the

Mass starvation of the past decade in Russia, Germany and Austria has left a grim record of its devastating action on the population.

organism which, if allowed to progress far enough without being checked, may induce premature fatal termination.

It must be recognized that fasting is an essential means in combating disease, a potent instrument in that armamentarium of the healing art known as therapeutics. But, fasting is a double-edged sword. It is not unlike dynamite, in that it may be a blessing or a curse, all depending on circumstances. In one case it may do a world of good, but in another case it may cause far-reaching damage, damage that it may be difficult or even impossible to remedy.

Obviously it is absurd to argue from the fact that normal human beings have been known to endure starvation for a long time without incurring harm and even deriving some distinct benefit from it, that this would hold equally true for every human being irrespective of age, sex, physical condition or state of health. After all, long fasts, when not entered upon through self-immolation or through religious fervor, have been generally undertaken in the spirit of a sport. In fact in Germany these fasters have always been called "hunger artists" with a keen appreciation of their motives. Such performances, however, are primarily feats of endurance, interesting to be sure and at times even highly instructive, but feats none the less and as devoid of real significance as marathon dances so far as the reactions of the common run of mortals are concerned.

To suppose that the benefits of fasting are deliberately withheld from patients by those entrusted with their care is too ridiculous to require refutation, but it is true that fasting is not a favorite method for the treatment of disease. Physicians prefer not to resort to fasting in their combat with disease principally on account of the difficulty and frequently the impossibility of securing the necessary cooperation from the patients themselves. For in spite of all that has been said and written about fasting and its probable benefits, in spite of every assurance that hunger pangs pass away in a short time, it is well not to forget that the hunger sensation is one of the most powerful primitive urges of the organism and one that demands satisfaction at times with complete oblivion of the possible cost. In times of famine this instinctive hunger urge has been known to drive people to the commission of acts repulsive in their very nature to the finer sensibilities and customs of civilized men.

Hunger is the most relentless tyrant in the world. Its commands, given at first *sotto voce* and echoed as a faint sucking pain in the pit of the stomach may grow *crescendo,* and finally may become an overpowering roar of thunder preempting and filling the entire structure of the conscious existence. Hunger can transform man into beast in obedience to its demand for gratification. The hunger urge may be harnessed by an exercise of supreme will power just as the primordial sex urge can be suppressed.

Some may perhaps be so constituted that they have a low hunger sensitivity just as some persons have a lower pain sensitivity than others. Among mentally deranged patients the not infrequent loss of appetite and refusal of food may find its interpretation in a similar lowering of the hunger sensitivity. Of course, the loss of appetite often accompanies disease and would thus make fasting a much less acute experience than in the normal healthy individual, but even so there still remains the anxiety of the patient and, what is even more serious, the anxiety of his kin as an obstacle to the administration of this treatment.

To meet this situation and yet give the patient the benefits of fasting, some clinicians resort to a ruse for quieting this feeling of anxiety by prescribing diets practically devoid of nutritive value. This makes it possible for a person to enjoy the grace and amenity of the dinner board and of the circle of his family and friends, and to have the sensation of fulness in his stomach, which sometimes goes a long way toward assuaging the sharper notes of the hunger call. In other words, a high grade of undernourishment is substituted for acute fasting by means of dishes skilfully concocted to appeal to the

esthetic sense as well as to the sensations of smell and taste of the patient. Such food, however, is but a subterfuge intended more to unload the mind of its anxiety than to load the body with nutriment.

The appreciation of the therapeutic value of fasting based on scientific medical observation and experiment is not to be confused with the cult which proclaims fasting a facile panacea for all ailments of the flesh. The idea that fasting is effective in curing disease is very old. The ancient legends of the Maori, which date back many thousands of years, state that when anybody is out of sorts the "inner man" is unhealthy and rest from food and certain exercises are recommended to put this "inner man" in good form again. Possibly the loss of appetite generally accompanying sickness has early in the history of mankind dictated such a course, which later was rationalized into a system of healing.

The ultimate theory of this healing cult, however, is a philosophy of disease which assumes that ailments flow from a common cause; namely, intoxication. Since the most obvious forms of intoxication result from the introduction of harmful substances into the alimentary canal, food has generally become identified as a source of intoxication and the abstention of the sick as a purposive instinct to guard against this.

The fasting cult rests on two pillars: one, the idea of food intoxication; the other, the idea that fasting promotes elimination from the organism of the intoxicating factor. In other words, it is assumed that fasting exerts a purifying effect on the organism which endows fasting with great medicinal virtues as well as transcendent value in religious ritual. Hence, the healing and the ritualistic use of fasting are historically inseparable.

It is not easy to extract from the metaphysical verbiage in which this theory is clothed just what that intoxication is or the precise method whereby the fasting organism rids itself of the intoxication. Experimental studies on the chemical changes in the blood, the life fluid of the organism, during prolonged fasting fail to substantiate such a conception. For instance, the so-called nonprotein nitrogen of the blood tends to increase with the progress of fasting. The nonprotein nitrogen represents the sum total of all the different metabolic waste products derived from the protein substances entering the blood from the tissues. In an advanced stage of fasting these nitrogenous waste products may accumulate to such an extent that the blood composition assumes a strong resemblance to that found in certain diseases associated with defective function of the kidney. This condition is the more surprising since these nitrogenous products are the unutilized fragments of the protein as it undergoes destruction in the metabolism of the body, and during fasting the protein metabolism is at a very low level.

Hunger is a relentless tyrant. It drives people to commit acts repulsive in their very nature to the finer sensibilities of civilized men.

Another quite remarkable phenomenon and one that occurs early in fasting is the striking rise in the uric acid content of the blood. This change in the chemistry of the blood again bears a close resemblance to what is found in gout or in nephritis.

The causation and the mechanism of these chemical changes in the blood cannot profitably be discussed here, for to follow such discussion requires a highly specialized knowledge. The important thing, however, is that this resemblance to a kidney disease is entirely superficial, since there is no evidence that the kidney is directly involved. In fact, functional tests show that the kidney is not damaged.

Furthermore, investigation has shown that as soon as the experimental subjects are fed, and thus a greater strain than before thrown upon their kidneys, the chemical condition of the blood goes quickly back to the normal. Had the kidney been actually damaged, such a quick recovery would be utterly inconceivable. A study of the condition of the blood, at least so far as its nonprotein nitrogenous constituents are concerned, fails to substantiate the idea of purification through fasting but would lead to quite an opposite conclusion.

The mineral composition of the blood is practically unaffected by fasting for a long time; until the body has lost a fifth of its weight through fasting there is almost no change from the normal. In advanced stages of fasting—when already as much as from three to four tenths of the body weight has been lost—a significant alteration in the blood composition appears, consisting in a lowering of the chlorides and a rise in the bicarbonate content of the serum.

This deserves special consideration because it is undoubtedly associated with definite and important events occurring in the fasting organism. The diminution in the chlorides of the serum could not be attributed to an excessive loss of salt through the urine, because in the later stages of fasting the elimination of salt in the urine is negligible. The lowering of the chloride and the rise of the bicarbonate must be considered in conjunction with the change previously described, the increase in the nonprotein nitrogen of the blood. The blood chemistry is similar to the condition encountered, for instance, in cases of intestinal obstruction. This leads to the conclusion that in fasting, as is also the case in intestinal obstruction, a toxicosis is present. The theory of the purifying action of fasting apparently is taking too much for granted.

Limiting the food consumption is a successful method of treating a few diseases, notably diabetes, but it is a method difficult to practice.

The danger of starvation intoxication and of its blighting effects is, of course, remote in fasts of short duration, but its possibility must be fully recognized and its danger signals known. In a man of average build the daily loss of weight is from three-fourths to one pound in acute fasting. Chronic underfeeding acts the same way but it takes a longer time to bring about the same quantitative effect. The loss in weight must be carefully watched so that the percentage loss does not pass beyond the safety margin. For patients already in a reduced state proper allowance must be made.

The metabolism during fasting is appreciably below normal, less material being consumed and less heat being produced, but this does not signify that the fasting organism lives more economically. It requires less energy because it lives at a lower grade owing to the lessened activity of the thyroid gland. Hence, there is the tendency for the temperature of the body to decrease and for the respiration and the heart action to slow down considerably, and this in turn brings about a marked drop in the blood pressure. In the human subject furthermore there is an overproduction of acids in the metabolism resulting in a condition generally designated in medical terminology as acidosis.

The experience gained from mass starvation, especially that of the past decade in Germany, Austria and more particularly Russia, is a grim record of its devastating action on the affected populations, a record most deeply imprinted apparently upon the system of the glands of internal secretion. But if one looks carefully at the situation one finds that the picture is not wholly painted in somber colors and here and there among the heavy shadows light spots may also be discerned. Of course, there were the hunger edemas and hunger osteomalacia (softening of the bone); there was an appalling spread of tuberculosis, a lowered sexual potency, cessation of menses, a diminished fertility and a great incidence of myxedema (a disease caused by a partial loss of activity of the thyroid gland), but to offset these dire effects of mass fasting and undernutrition it has also been noted that there was a marked decrease in the number of diabetes cases, certainly of the more severe type, and a reduction in the number of cases of exophthalmic goiter, a disease associated with an increased activity of the thyroid gland.

What is the meaning of all these observations? It means just this, that fasting does not affect all persons alike, its ultimate influence being determined by the constitutional peculiarities of the individual. One of the fundamental effects of fasting, as was pointed out previously, is the lowering of the thyroid gland activity, manifesting itself in a lowered metabolism with low

heat production, in a slowing of the pulse and relaxed heart action. It is not surprising that persons with a tendency to thyroid overactivity were benefited by the enforced undernourishment during the lean years of the war. On the other hand, those who have already had a constitutionally weaker thyroid action were "pushed over the edge," so to speak, by the same condition and have helped to swell the ranks of myxedema patients.

The striking reduction in the number of diabetes cases deserves further consideration. It is known that the incidence of diabetes is parallel to the per capita sugar consumption and that in a great many instances the disease is a penalty one pays for overindulging the appetite. No wonder, therefore, that the group of persons habitually excessive in their food consumption should have been benefited by the food stringency.

Diabetes is one of the few diseases that responds favorably to treatment by fasting, and it is a generally accepted rule in the treatment of this disease to keep the patient alive and thin by limiting the food consumption rather than to let him eat freely and die early. At one time the treatment of diabetes was a fasting treatment, and even now in the most severe cases with high blood sugar concentrations, this is still the treatment of choice. However, modern therapeutics has made marvelous strides in the handling of diabetes and has put at the disposal of the practitioner means whereby excellent results are obtainable without recourse to fasting, which is under the best conditions a method difficult to practice.

For acute gastro-intestinal as well as gall-bladder trouble fasting for several days is a valuable therapeutic procedure, and so is also its use in treating acute forms of glomerular nephritis. Even in chronic cases of nephritis associated with disturbances of the heart action, it is maintained by some clinicians that short fasts, usually of from eight to ten days, duration, are effective. Apparently some skin affections likewise respond favorably to the fasting cure.

Just why and how fasting benefits these patients is not really known, but it is certain that the method must be employed with much discrimination and keen clinical judgment. This is perhaps best demonstrated in the case of sick babies. There are conditions in which a fast of from twenty-four to forty-eight hours is the only thing that will save the baby's life, but not every baby can be submitted to this treatment. There are even closely allied conditions which only the expert in handling of the sick infant can properly differentiate, and in some of these fasting would be about the worst thing that could be done for the little patient. It is also interesting to observe that breast-fed babies withstand fasting much better than bottle-fed babies, and also make quicker recoveries.

Even in the reduction of corpulence fasting cannot be employed unless the factor of a constitutional predisposition to obesity has been carefully ruled out. In the obese with a weakly developed musculature, the progress of the fast must be checked up by urinalyses to make sure that the protein store is not too rapidly wasted, and the patient's condition must be watched with utmost concern because, in view of the lowering of blood pressure and the slowing of heart action produced by fasting, vital physiologic functions may sustain serious disturbances from it.

Fasting is not a panacea, not a cure-all for disease, because there is no unitary cause of disease. Quite truly, those whose health has suffered from an indiscreet overindulgence in the pleasures of the table find in fasting wonderful relief. This, unfortunately, does not endow them with an immunity and does not insure them against the evil effects of repeated indiscretion.

While fasting is often the therapeutic procedure of choice, there is nothing mysterious or supernatural in it as a means of curing disease. Fasting is merely an instrument—to be sure, an instrument of great potency—and it requires like all instruments skilful manipulation to be of real value and service. Fasting for health can be hardly recommended as a pastime and its employment for treating disease is not the proper field for amateurs.

¶ Daughter and a young man caller are surprised in the midst of a "petting party" by dad's arrival. Dad is surprised too, but does not lose his temper.

For a brief second

Dad Comes

CONTRARY to his usual custom, Doctor Branch left his roadster at the garage. There were a few minor repairs to be made in the morning, and after the long and cold night ride of 200 miles from the consultation, the thought of extra early rising was far from agreeable. He was tired mentally and physically. Even the crisp night air failed to rouse him from his depression as he slogged along the pavement toward his house. Thank God, the family were all asleep at this hour. They would not expect him home. That was at least one comfort in living as he had been living for several years; he could come and go as he pleased at any old hour day or night, and no one in the house paid any attention to it.

He turned in at the driveway and walked a little more cautiously toward the side door, which opened into the office waiting room. The key turned the lock noiselessly, and he stepped inside where the comfortable warmth mingled with the faint odor of drugs greeted him refreshingly. He paused a moment in the waiting room, then, instead of going through to his office, he opened the door into the hallway, vaguely lighted by the dome-light at the head of the stairs. Across the hall the parlor lay shadowy dark, with faint trickles of light from the street lamps and passing automobiles. Perhaps there was some mail on the mantelpiece for him. He tiptoed over and switched on the light.

There was a sudden commotion in the direction of the corner where the davenport stood, and he was aware of two figures before him, his daughter, an attractive girl of 17, and a young man whom he had never seen before. For a brief second all three stood staring in astonishment; then the girl recovered herself and tossed back her disheveled hair, her surprise giving way to anger. Her eyes flashed.

"Daddy!"

The word carried a volume of mortification and irritation, with a degree of defiance that was apparent in the upward tilt of her chin and the set of her shoulders. She was a splendidly built, athletic type of girl, well above the average height, and with the heightened color of anger in her cheeks she was almost regal. Her companion was a rather fine looking young man of

all three stood staring in astonishment.

Home Late

By Henry Pleasants, Jr.

perhaps 22, who stood a little awkwardly to one side. He had not adjusted himself to the situation as quickly as the girl, but the doctor noted with some satisfaction that the reaction of the young man, while perhaps slow, was deliberate and cool and unafraid. He saw the flush of embarrassment on the young man's face fade to a spot of color, and the surprise and chagrin in his eyes change to a glint of determination. He liked that.

The girl smoothed her dress impatiently and stamped her foot, surveying her father with an impudent stare. "Well, you caught us, didn't you? Caught us petting at midnight. Going to raise hell, I suppose." Her lower lip trembled slightly and her eyes filled. "I think it was rotten of you to sneak in that way. It was mean!" Her composure melted in a sudden blaze of anger, and she started to brush past her father toward the stairway.

The doctor stood looking down on her with a queer expression in his eyes. She had always been a little more of a favorite with him than the boys, and they had been wonderful pals until lately. He had noted the change, and it had hurt him a little. There was no particular trouble that had arisen; they had simply drifted apart. As he looked at her his eyes hardened with a slightly cynical flash. She met his gaze for a second with a little of her former bravado, then her eyes fell, and she shook with stifled sobs. The young man stepped forward and put his hand on her shoulder as he faced the doctor.

"It's all my fault, sir. Don't blame Mary."

The doctor shifted his feet and felt for a cigaret, which he lighted deliberately as he studied the couple before him.

"I'm not blaming either of you," he said slowly.

The girl shook off the boy's hand and made another effort to pass her father. "Let me go. I want to go up stairs. Why are you so hateful?"

"Steady now, girl. Steady a bit. What's the use of making all this fuss? You are not going up stairs yet. And don't make so much noise. Do you want your mother to hear?"

"I don't care."

The doctor's face twitched painfully. "Well, I do. Listen to me, Mary. I'm not sore or disgusted or anything. This is something for the three of us to talk sensibly about without hysterics. By the way, I'd like to know this young friend of yours. You might calm yourself enough to be reasonably polite."

"Bill Harris," the girl blurted out. "And I don't care, I like him a lot," she added defiantly.

"So-o. Well, I'm glad of that, daughter." The doctor's expression relaxed, and a humorous twinkle came into his deep set gray eyes. "I rather like him myself, so now that the fireworks are over we might as well get comfortable. Let's throw a log or two on the fire and rest ourselves. I'm dog-tired. Sit down, Bill. I'm not such a vicious old crab as Mary makes out."

The girl's defiant expression vanished, and her eyes filled again. "I know you aren't, Daddy. Please forgive me."

"She is not the one to be forgiven, Doctor Branch," interrupted Harris, "I've made all the trouble tonight. B-but it really wasn't as bad as it seemed. I wouldn't have you think that of Mary. I'm going to tell you right now that I love Mary, and I want to marry her."

"H-m-m." The doctor poked the dying fire into a blaze and threw on a log or two. He took a few whiffs of his cigaret and flicked it into the coals; then he stood for a moment leaning thoughtfully against the mantelpiece gazing off into space. The girl settled herself in a large armchair, and the boy seated himself on one of its arms beside her. Presently she leaned over against him and drew his hand down over her shoulder. The doctor smiled softly, then straightened up and began filling his pipe.

"I like you two kids a lot," he began abruptly. "What made me sore was my throwing both of you into a defensive attitude when I surprised you in a petting party. That was not so good. It told me that I had been wrong in not having been a little more frank with Mary in the past few years. I'd left everything to her mother, who is a most excellent mother, but she has been brought up with the idea that physical love, the greatest of all human emotions, is sin. From that standpoint, of course, I ought to have been highly shocked and grieved when I caught you. I should have registered anger and raised hell generally. That was what you expected, wasn't it? That was why you were so disturbed when I came in.

"I'm not as old fashioned as I once was. I've learned a few things in the practice of medicine and by bitter experience of my own. It occurs to me that it is time for me to take a hand right now and talk things over. You kids of the present generation are not fools. The so-called 'revolt of youth' is nothing more than an effort to learn the truth and to break away from some of the idiotic fetters of ignorance, convention and misinformation that have hampered the true happiness of human beings for ages. I'm going to do my talking right now before Bill. I'm going to call him Bill because I like him, and I'll trust him to understand me. I don't know who he is or who his people are, whether they are socially elect or whether they are jailbirds, but I like his attitude and his face. If he had been whimpering and cowardly when I switched on the light I'd have simply kicked him out. So much for that.

"Now, young lady, I want to say something pretty frankly to you. You say that you like Bill. I'm not asking whether you love him or not. But you like him well enough to be mightily thrilled when he comes to see you and you park on the sofa. Bill is equally thrilled at seeing you and sitting on the sofa with you, or he wouldn't be here. All right. Then you are both pretty crazy about each other, and it means a lot to you to be together alone. Fine! Is there any harm in it? Well, that's another thing.

"The trouble is that neither of you know your own minds. The physical side is really the predominant factor in your attachment now. You know it is, well enough, even though you will not admit it. It's all very well to try to bluff yourselves into the idea that it is not, but you cannot make me believe differently. Mary, you are old enough to know that you are attractive physically. All of you girls of today are doing your darndest to attract men—physically. Your scanty dress and your dances and everything you do is based on the idea of making yourselves physically attractive.

"What I want to know is what sort of a deal are you giving this man Bill. He seems to me like a square-shooter. From the look in his face I know that if he considered that he had compromised you tonight he would have asked you to marry him right away. If I even suggested such a thing he would do it now. Am I right, Bill?"

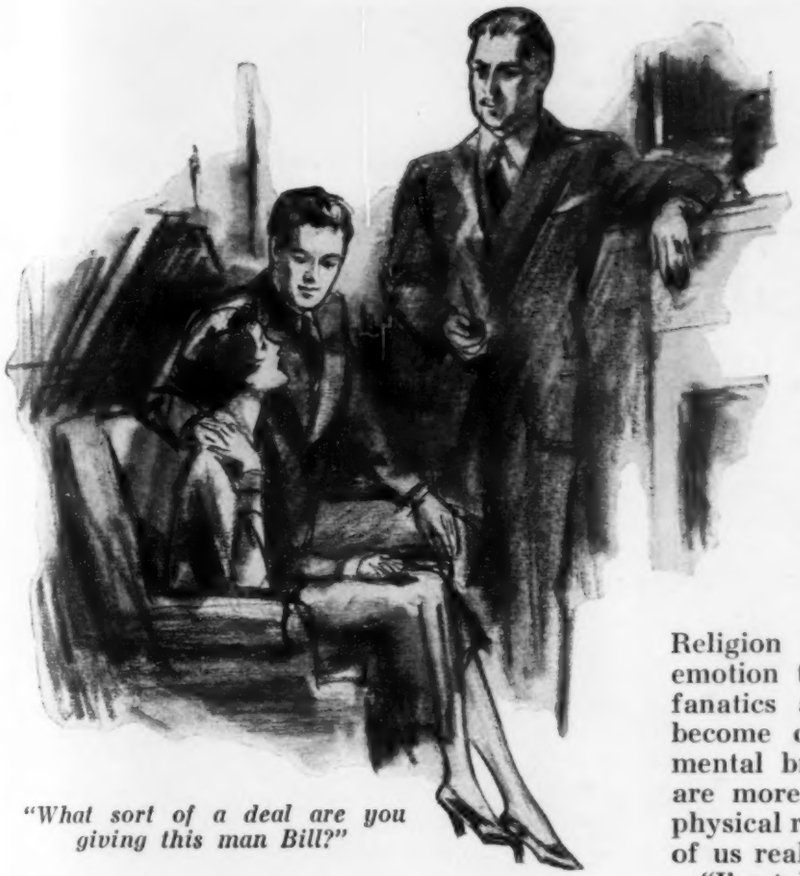
"Yes, sir."

"Well then, Mary, I ask you how you really feel about it. You, perhaps, think you love him enough to marry him. If I gave my consent right off you'd be willing to go through with it provided you had enough to live on. Is that right?"

"I guess so, Dad. But—."

"Wait now. I have not finished. You've been thinking of marriage from the physical side more than anything else. You girls talk of nothing else, I know you do. Did you ever stop to consider whether or not you and Bill would have anything else to carry you along when the physical side of life was perhaps at a standstill? Do you care for Bill because he is Bill or because he is an attractive specimen of manhood? You've been pretty crazy about plenty of other fellows. You may as well admit it.

"You don't have to answer these questions. Just think them over together. I'm putting things a bit bluntly to you. Of course you will say that these petting parties are innocent, and all that, but human beings are human beings just the same, and there comes a time when you either get overpowered or else you suffer a tremendous nervous reaction as a result of your self-restraint. Neither one is too good!



"What sort of a deal are you giving this man Bill?"

"Marriage as it exists today is a mighty queer institution in some ways. It is a magnificent institution in civilization, but it has been badly handled and sorely abused. It binds two people who know nothing of each other's deeper feelings, and then solemnly announces, 'Whom God hath joined together, let no man put asunder.' In less graceful language 'Like it or lump it, you are hitched. Now kick and be damned!' It is that sort of thing that is breaking down the confidence of the world in the greatness of marriage.

"What I want to know is whether you understand some of the things that are before you. If Mary's interest in you, Bill, is physical and no more, then when the physical side of her life is complete by her having one or two children, will she not find that her interest in you is at an end? Will she not perhaps loathe the sight of you and tolerate you in the house only as a meal ticket?

"If your interest in her is only physical, how soon is that going to die out when she becomes unattractive? Your sense of duty may tag you along, and you may try to make the best of things when she becomes dowdy with household duties, but how far will such a situation carry you? If she detests having you around it is a safe bet that she will do mighty little to make herself attractive to you in word, dress or action. And when you couple that with a loss of interest on your part, and, perhaps, the introduction into the picture of a third party, you have the familiar triangle staring you in the face.

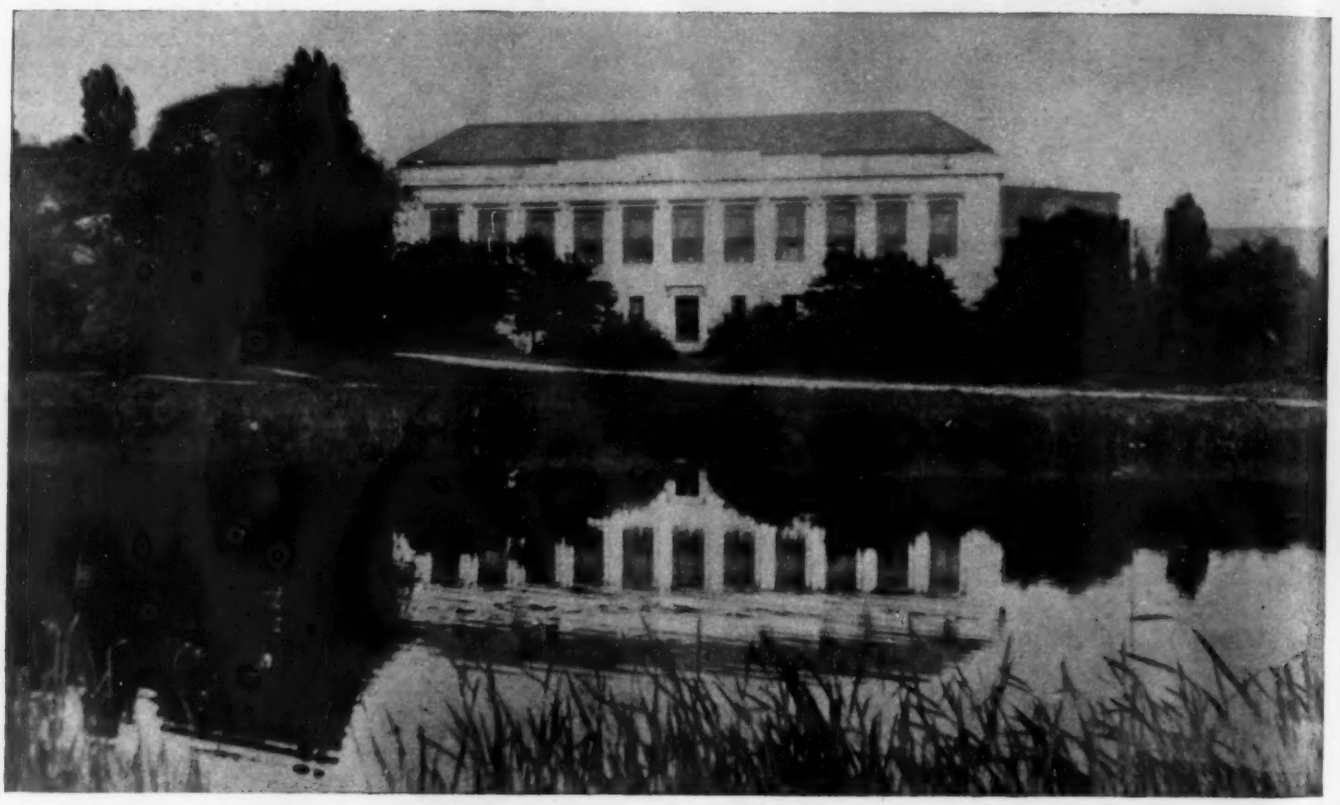
"Don't let me give you the idea that all petting parties are a bad thing. Personally I think that the emotions stirred up by these intimacies may lead the young men and women to understand each other better and to enter married life with less of a cold attitude. There is no greater hell on earth than for one to be highly emotional and the other frigid. And as for the emotion of two lovers being sinful, which our mid-Victorian forbears would have us believe, it is all rot! Religion has built up a tremendous foundation on the featuring of human emotion as sin. It has tortured more people with such teachings than history can ever tell. Religion has further distorted deep physical emotion to its own uses and ends, producing fanatics and all sorts of perversions, which become dangerous and lead to suicides and mental breakdowns. In my experience there are more nervous breakdowns as a result of physical repressions and abnormalities than any of us realize.

"I've talked a lot. I'm going to stop and leave you here to talk some more together. I'm not afraid to leave you unchaperoned. There are things for you to think about and talk about. The trouble is that the world has not been giving you kids a square deal. It is as bad one way as the other. If a boy and a girl get into difficulties the girl is the one who has to bear the brunt of the disgrace. But, on the other hand, when a girl's fond parents encourage her to compromise a desirable man into marriage, then it may be the man who suffers if the girl cares nothing about him. Most often parents are afraid to tell the truth to their children for fear they will avoid matrimony. I don't want my kids to be faced with any such proposition when they decide to be married. They will know the truth."

The doctor knocked the ashes out of his pipe and smiled at the couple before him. The expressions on their faces had changed now to deep seriousness. The young man met his kindly glance with a look of relief and gratitude. He hesitated a moment, then said: "I wish you would stay and talk a little longer, Doctor Branch. You've opened up a good many ideas that I'd like to know more about. It is a good thing to have some one to talk to as you have talked to us tonight."

"No," the older man replied, moving toward the door, "if I talked any more tonight I'd be afraid I'd bore you. You've been such good listeners that I might take advantage of you. I guess we understand each other better now. Good night."

Taking the Child to the Dentist



Upside up and upside down—two views of the Forsyth Dental Infirmary for Children, Boston.

INTELLIGENT parents frequently ask the question, "When should I first take my child to the dentist?" A child should make his first visit to a dentist as soon as all his baby teeth are erupted. This is at or a little after his second birthday. Only in exceptional cases will actual dental work be necessary at this time.

The purpose of the first visit is to allow the child to become acquainted with the dental office and with the dentist. His first visit, if possible, should never be associated with pain or much unpleasantness. Psychology teaches us that early first impressions are usually lifelong. For this reason an early visit consisting possibly only of an examination is of great value to the child.

The first visit gives the dentist an opportunity to educate the parent regarding the child's tooth problems. Parents learn in a general way from things they read, but frequently do not or are not able to associate them with their own children. The dentist, however, can point out certain things that are happening in the child's mouth and if necessary suggest their correction. It is important that such habits as mouth-breathing and thumb-sucking be corrected at as early a date as possible.

The child should then be brought to the office at regular intervals, according to the plan of his dentist. At these visits it may be necessary to polish the teeth and to remove stains which could not be removed with the child's tooth brush. In case decay has started, the cavity can be quickly and easily filled with little or no pain.

Thus the child's mouth is kept in a healthy and comfortable condition during

By William M. Gardner

those years when more than at any other time wholesome, well masticated food is essential to growth and proper development.

The foregoing program may be contrasted with a less ideal, though probably the usual procedure; that is, of not taking the child to the dentist until a tooth aches. The keen interest in teeth manifested by parents during the teething period disappears as soon as the last baby tooth is cut. The child's teeth are then neglected and forgotten, until one fine day he complains of a toothache. A few home and drug store remedies are applied, but finally when the ache becomes insufferable the child is taken to the dentist.

Gold fish bowls and fairy tales in tile help small patients pass the time in the children's waiting room at the Forsyth infirmary.

Unfavorable Time for First Visit

Though necessity makes the visit imperative, it is a most unfavorable time for a first visit. The child is probably fretful because of several restless nights and perhaps feverish and toxic from the infection in the aching or abscessed tooth. No matter how kind and considerate the dentist may be, the nature of the work to be done is trying and painful enough to create an unpleasant impression at best. It will be difficult indeed to persuade the child to have necessary fillings done.

Parents must be guarded in their conversations before or with their children concerning dental matters. One frequently listens to adults talk before children about unpleasant dental experiences, giving many and often much exaggerated details. This is likely to make the child who has never even seen a dentist apprehensive. The highly nervous and imaginative mind of the child may picture the drill as a red hot poker and the dentist as a red-faced possessor of horns who delights in torture.

When such a child is taken to the dentist, he is assured that the dentist will not hurt. After the harrowing experiences recounted before him, even a child's credulous mind is suspicious. If the nature of the work is such that pain is necessary in its performance, a distrust in both the parent and the dentist results. It is poor judgment to make promises that cannot be fulfilled and only makes worse an already bad situation. The child should be told the truth, that it is sometimes necessary to hurt a little but that the dentist will work as carefully as possible. The child will usually listen to the argument that it is much better to be hurt a little than to let the tooth decay until a painful toothache results and the tooth must be lost.

How Adult Fears Were Founded

A careful analysis of the fears of many adults shows that in most cases fear has its basis in an unfortunate and painful early experience. Thus even in later life teeth have been neglected and lost because only a toothache can force such persons to seek a dentist.

Prevention of serious dental disease, as well as prevention of dental fears, is dependent on early and regular visits to the dentist.

She inquired kindly about the grocer's wife.

Nutrition in

By Elva

MRS. HENRY CRABBET, club woman, and mother of four school children, meditated as she put on her hat and picked up her shopping list. Next Friday is club meeting, she thought, and I am chairman of the program. Let me see, what is the subject to be discussed? Oh, yes, malnutrition. What a subject! With all the interesting topics, such as household budgets, child development and family relations, why did the committee pick one with such a forbidding sound?

Malnutrition—why, that is an old subject, she thought. If she remembered correctly it was popular directly after the war. She recalled how the newspapers and magazines had put such emphasis on undernourished children. But that was all past now. Surely the children suffering from severe undernourishment in warring countries had been taken care of by this time. That condition had been due, she remembered, to food blockades, destruction of fields and gardens by invading armies, and to the tremendous rise of food prices. There had been so much publicity at that time, that of course every one must have become well informed on malnutrition. In these modern days people know about nutrition work of all kinds. Well, anyway, she mused, I can stop at the library and look up a few statistics.

As she walked down Main street she met her neighbor Mrs. Brown and stopped to chat. Had Mrs. Crabbet heard about the health tests at school? No? Well, they are giving them in all the grades and in high school.

"More of these new fangled notions," said Mrs. Brown. "My little Ethel has to have a glass of milk every morning and afternoon now, as she is underweight. You know I never could get her to drink milk; she likes tea and coffee better. I know she is nervous and terribly thin but her papa is thin, too. Her Grandmother Brown is thin, just a shadow; you know thinness runs in our family. Ethel takes after her Aunt Sadie Brown; why, she never weighed over 90 pounds. I hope they can get Ethel to drink milk; I never could at home."

When she could politely leave, Mrs. Crabbet walked on. As she approached the Jones residence she hesitated. Perhaps she should call on Mrs. Jones and ask her daughter Mildred to sing a solo at the club meeting. Such talent was welcome at all entertainments. Mrs. Jones met her at the door with the information that she had been helping Mildred pack.

"Is Mildred going away?" inquired Mrs. Crabbet.

"Yes," replied Mrs. Jones, "you know Mildred hasn't been feeling at all well lately. She worked too hard at the conservatory of music in Chicago last year. She didn't eat the right foods, and what with her hard work and all, she is in a rundown condition. Actually the doctor says she will develop tuberculosis unless she has special food and a complete rest, so we are sending her to a special camp."

Mrs. Crabbet expressed her sympathy and left shortly. At the corner she met Miss Green, the local milliner. In answer to her greeting, Miss Green shook her head. "I am on a diet now," she complained. "The specialist says I never will get over this sinus trouble unless I eat more. He says I need vitamins and plenty of calories, and I tell you it is a task taking nourishment between meals. At that, I am not as bad off as Mrs. Smith. Haven't you heard about her? She has a complete nervous breakdown caused entirely by improper diet. Did you ever hear of such a thing?"

No, Mrs. Crabbet hadn't, and she hurried on into the grocery store. As she completed her

"Is Mildred going away?" asked Mrs. Crabbet.

Centerville

E. Cronk

The Woman's Club listened to an inspiring talk.

order, she inquired kindly about the grocer's wife, who had a baby only four months old.

"Not very well," the grocer answered. "She has been so upset about the baby. I guess the little fellow was in a fair way to have rickets. His formula hasn't been right, and what with fussing over it my wife is all worn out. She hasn't any appetite and I am worried about her."

Mrs. Crabbet walked across to the dry goods store to get a wash suit for her youngest child, James. There was a new clerk in the children's department, she noted mechanically.

"How old is your little boy?" inquired the clerk.

"Six years old, but he wears the five year size," she answered. As she met the clerk's gaze something seemed to snap in her brain. Why doesn't he wear size six? she thought. Really, she was getting upset; she would change the subject.

"Where is that Miss Harmon who used to be here?" she asked.

"Oh, she went to the hospital last night," answered the clerk. "She has a severe case of acidosis. You know she has been boarding at the cafeteria and her meals were so unbalanced that she is quite seriously ill. Kind of starved herself, too, I guess."

But Mrs. Crabbet had fainted.

Mrs. Crabbet hurried home. She would forget about the club meeting until some other time. She was met at the door by her oldest son.

"Mother, I didn't go to classes this afternoon. My tooth ached so badly that I went to the dentist. Do you know what he said, Mother? He said that my teeth were soft and subject to decay. He said that before I was born you should have had plenty of milk, fresh vegetables and teeth-building foods and that I, too, should have had more of them as a baby."

Mrs. Crabbet schooled herself to control and went into the kitchen to help the maid prepare dinner. Just then the youngsters rushed in.

"Oh, Mother, see our health cards," they shouted. With a premonition of trouble, Mrs. Crabbet took the cards and sat down. The first one was Robert's, aged 10. Written across his card in large letters were the words: "Must have tonsils removed." Well, she had intended having that done. What was this? She looked closer—"Diseased tonsils; result of malnutrition." Horrors! She had always thought malnutrition was due to tonsils. No matter, another vicious circle. She examined the card of her daughter Jane, aged 15—"Anemic; caused by undernourishment and lack of iron in the diet." She felt staggered. Jane had looked a little pale of late. She sat dazed.

Then she heard Henry coming. Well, he could share these problems about their children.

As Henry came in and took off his coat, he remarked, "Funny thing happened today. You know that extra life insurance we talked about, well, I tried to take it out today and the doctor said—" but Mrs. Crabbet had fainted.

On Friday, February 11, the Woman's Club of Centerville, Ill., listened to an inspiring talk given by Mrs. Henry Crabbet. Her subject was malnutrition. Mrs. Crabbet brought out vividly the fact that so many adults and children are undernourished in homes of economic comfort and even wealth, because of lack of knowledge on the part of homemakers. She gave statistics to show that our rich and powerful country had to an extent probably greater than any other nation the problem of malnutrition unassociated with dearth or poverty. This subject, she said, was of national importance, and a nutrition program was necessary in every community.

As a result of the excellent speech by Mrs. Crabbet, a nutrition program was sponsored by the club, as the members wish to keep in touch with all modern movements.

Eyes *for* Ears

An Article on DEAFNESS *by* Emma Viedy

H. Armstrong Roberts

The child who is normal today may be started toward deafness by the heavy cold he will catch tomorrow. The eruptive fevers may injure hearing.

THEY entered the street car quietly, two women, a boy and a girl. Neatly, even well dressed, there was nothing to attract the attention of the rest of the passengers. But in a few minutes every eye was riveted on the quartet. Where had been mellow September sunshine in all four faces, a December thunderstorm now raged. Surely in a minute they would fly at each other's throats! With faces contorted, violent expression succeeded violent expression. All this, however, without a sound. At times the children took up the theme of their elders and embroidered it with vigorous arm and finger movements. The other passengers soon realized that it was merely the peculiar gestural speech of the congenitally deaf; and people who understand this language would have translated all this fury without sound as signifying nothing but a few comments on the weather.

Probably every parent in the car had the same feeling of thankfulness, that his youngsters need not go through the world handicapped as were these four users of the sign language. Yet a little troupe of five or six out of every hundred children is destined to experience a handicap very similar, unless the cause is discovered in time.

Your child who is normal today may be started on the road to partial or complete deafness by the heavy cold he will catch tomorrow. If the cold doesn't start him, perhaps measles, scarlet fever, diphtheria or any of the acute eruptive fevers of childhood will. This statement is not so extravagant as it sounds. At the Dallas convention of the American Medical Association, Drs. E. P. Fowler and Harvey Fletcher estimated that three million school children in America had defective hearing. The two doctors did not get their data from their imaginations, as will be shown. But the data used for this estimate have been so recently worked out that school authorities and even general medical practitioners are surprised at the results.

Ten years ago, not one city in the world knew, or could make a guess, as to how many of its children had defective hearing. The only way of finding out, in those days, would have been at a cost so great in time and money that the mere mention of it would have been sufficient to put any school board into a state of coma. What with teachers determined to approach bricklayers and plumbers in the matter of salary, and with the irate Mr. John Quincy Taxpayer armed to the teeth to protect the honor of his pocketbook, school boards could not afford to listen to any hideously expensive health promotion plans—not if they expected to remain school boards.

But new and inexpensive methods of testing ears have changed all this. The figures already

obtained should nudge the nodding parent or educational authority into giving serious attention to the little army of children with limping ears. In a survey, at Fort Worth, Texas, more than 3,000 children were found to have a 9 per cent (or greater) hearing loss. In Cincinnati out of 5,440 children tested 452, or 8 per cent, had a 12 per cent (or greater) loss. The same story with figures that do not vary greatly comes from St. Louis, from Rochester, N. Y., from Chicago and Minneapolis. Complete figures are not yet available from any city except Fort Worth, as the business of testing the ears is too young. An odd fact, in seeming contradiction, is that in any one city the percentage varies greatly in the different schools. In private schools or in ward schools in exclusive residential districts, the figures may drop down to 2 per cent. But in congested foreign districts where doctors are a luxury or where they sometimes are almost as ignorant as the patients they treat, children and babies must worry through any ailment they may contract, with a consequent rise in the percentage of ear and other defects.

Loss of Hearing Is Progressive

Are all these children found by the surveys really deaf? By no means! Nature gave us all more hearing ability than is needed in a "civilized" community, where radios blare by night and steel woodpeckers rivet structural ironwork by day. So we can lose quite a bit of hearing before we show any signs of deafness. However, these children face possible future deafness, for ear troubles are all too often progressive.

The ear specialists say that about 80 per cent of the persons who become deaf in adult life could have had good hearing if their trouble had been recognized in time. But long before adult life is reached these children may be seriously handicapped. They hear nearly all that is said to them, enough to give parents and teachers the impression that they have heard all. Perhaps the one essential part of a sentence is just what they have missed. A sad fact is that these children themselves are quite unaware of their trouble. They hear too much to realize that they don't hear enough, and they remain unaware of their defect until it has reached a dangerous stage.

These children, unable to keep abreast of others with good ears, tend to sink back and give up the struggle. Since, try as they will, they cannot seem to satisfy the school's requirements, is it any wonder they become discouraged? Here and there, however, is a child with a definite hearing loss who has never failed a grade. Superior minds or more intensive application account for these exceptions. They succeed in passing, but at what a cruelly wasteful expenditure of nervous energy!

The close relationship between failure and defective hearing has been shown wherever hearing tests and scholastic records have been compared. The scholastic records of fifty children with subnormal hearing in one Baltimore school and eighty-eight of the same type in a Rochester, N. Y., school may be given here.

	Baltimore	*Rochester*
Repeated once	17	38
Repeated twice	12	26
Repeated three times	8	16
Repeated four times	6	7
Repeated five times	2	0
Repeated six times	5	1

What about the expense of all this repetition? If thirty-eight children in one school fail merely once because of poor hearing, we have a full schoolroom requiring one teacher, also light, heat, school supplies and janitor service that might be otherwise used. If we think only in terms of dollars and cents, this still amounts to a neat little sum in the round of a year. In the Fort Worth schools one group of 574 hard of hearing children made 729 yearly repetitions costing nearly $60,000, while St. Louis paid out more than $40,000 for 464 hard of hearing children, who made 1,862 quarterly repetitions. Yet it costs only an average of 12 cents per child to find those with defective ears, and certainly lesser sums than those mentioned would be necessary to prevent all this repetition. Is it

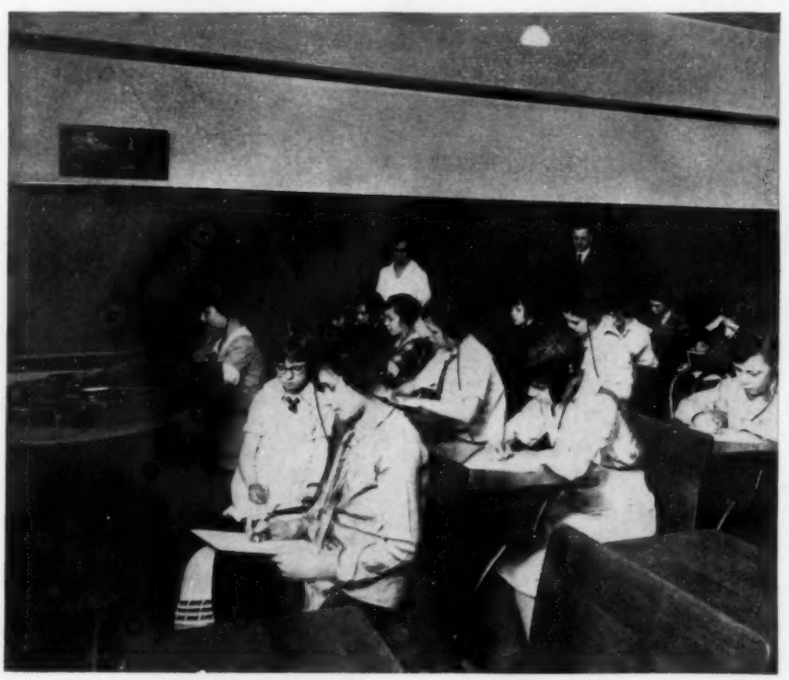
The child with a hearing defect may hear nearly all that is said, yet may miss the essential part of a sentence. Such a child is unaware of the defect.

good business or paternalism to find and help these youngsters?

It does cost money to let hard of hearing children fail in their school work but it costs much more than that. Adults rarely know the agony of being kept at a job quite beyond their powers. Instead they "resign to accept a better position." But parents and school authorities won't let the children resign to accept anything, without several years of constant failure and humiliation. What a deeply ingrained sense of incompetence we force on them before they finally get away from the educational treadmill!

Tests made on high school children show an amazing drop in the number of those with poor ears. This is not due, of course, to any cured deafness. No, the limping ears have at last limped out of the clutches of the truant officer. So in a world constantly growing more complex, and with greater need for education than the normal child, we force them into life's battle with blunt weapons and educational armor too short, too scant, too frail in substance.

Sometimes family ambition keeps the unfortunate child in school in spite of repeated failures. Ashamed and resentful, several years too old for the class, he plods on despairingly. We not only do nothing to compensate him for his handicap, but more often we refuse even to recognize it, and, if he is not our own child, we dub him stupid. Days and years of silence may await him, inability to support himself or to mingle with other people on any terms of equality, but do we give him anything to help in his difficult situation?



Forty children can put on the head phones of the group audiometer and the acuity of their hearing may be tested rapidly. Gone are the days of watch tick and tuning fork.

If we care enough, we can. First, perhaps we can give him back his good ears—not, however, unless we find him. The old days of the watch tick and tuning fork are happily gone. Now as many as forty children can put on the head phones of an instrument known as the group audiometer, and shortly we have a means of estimating their hearing acuity. They hear numbers being spoken, which constantly grow softer, until they reach the very threshold of normal hearing. The children write the numbers as they hear them. At the point where each child stops or where he begins to fake the numbers, as some few do, usable hearing has stopped. Retesting those with low scores weeds out those who have perhaps not understood what they were doing.

Certainly any child with a perfect score has also perfect ears. But even those who persist with low scores may not have organically defective ears. A physical examination may show the true cause of the trouble. Some children seem to consider their ears as storage places. Besides the hardened wax, which is so often the cause of a low score with the audiometric test, school otologists have found tiny toys, beans, paper wads, chewing gum, popcorn, shoe buttons, pencil erasers, or, as one doctor put it, "about everything except spare Ford parts."

Colds, diseased tonsils or adenoids may cause some of the trouble. If the right kind of treatment is given them, such children may join the ranks of the normal.

But an unpleasantly large number cannot be helped by any known medical treatment. What can we do for these little cripples? Well, we can train them how to substitute their eyes for their ears when the latter quit their job. Hearing speech with the eyes is not an impossibility at all. Before the movies became the talkies, almost every one had noticed how easy it was to see some of the things the actors said. With proper instruction, children become amazingly adept in following speech on the lips.

Just as children pick up foreign languages while their parents are floundering, so they learn "visible speech" in vastly less time than adults. An hour a day with a lip-reading teacher may enable a child to keep up with his grade. It may do vastly more, and give him the crutch that makes adult life, with lame ears, endurable.

If physicians, lawyers, architects and others who have lost their hearing can continue professional and social life by learning to use eyes for ears, we have here the clue to what we must do for children with hopelessly defective ears.

Indigestion, *So Called*

By Moses Behrend

THE term indigestion in its broadest sense is a misnomer. It includes a variety of symptoms ranging all the way from heartburn, gas on the stomach, acid stomach to gastritis, inflammation of the stomach, and various other terms that are applied especially by those who advertise their wares in the newspapers for the relief of these symptoms.

Some persons may experience a peculiar burning sensation in the pit of the stomach or in the region surrounding the heart, with or without pain. It is annoying and should be a signal for the person to seek medical advice. Heartburn may be due to pressure following overeating or too rapid eating. These symptoms are common in business and professional men who do not take sufficient time to eat their meals, especially their lunches, which are usually cold and poorly prepared. In order to avoid laying the foundation for stomach disorders we should always eat slowly and chew our food thoroughly so that the saliva may become well mixed with the food.

Let Us Not Be Gourmands

The stomach is a much abused organ as a result of overeating; the taking of too much strong liquor is another serious mistake. Of course we all eat too much. Some persons have hardly digested their last meal when they are ready for another. Let us not be gourmands. An appetite that cannot be satisfied should receive medical attention, because diabetes may be present or a tapeworm may be lurking in the inner confines of the intestinal tract.

We have all read of eating contests, the inordinate capacity for eating, with apparently no ill effects, hundreds of oysters, numerous pies and large quantities of ice cream. This abuse cannot go on forever. A time will come when there will be a reckoning. Death has often followed such indiscretions, and in other instances chronic invalidism. Too hot or too cold articles of food should be avoided.

Gas on the stomach finds its expression in eructations, which may be mild or violent, under the control of the will or involuntary. When food which disagrees with a person is taken into the stomach there is generated an unusual amount of gas, and relief is generally obtained by its expulsion through belching.

Acid stomach manifests itself by the vomiting of small quantities of sour-tasting material. The stomach manufactures a free acid, called hydrochloric acid, and other acids due to fermentation. When hydrochloric acid is absent from the stomach, the condition is serious. It may mean beginning cancer.

Often we read in the newspapers that a certain prominent person has died of "acute indigestion." What is acute indigestion? It is a term used by the layman to cover a series of disease conditions, often unsuspected and unrecognized, and these are the actual causes of death. As a matter of fact, there is no such condition as acute indigestion or indigestion at all. The sooner we are willing to discard this term the better. The real cause of death in these cases reported as acute indigestion is generally neuralgia of the heart (angina pectoris), hemorrhage into the brain (apoplexy), or inflammation of the pancreas (acute pancreatitis).

Distress in the stomach may be referred from some other organ. For instance, the function of the heart may be impaired, so that the heart does not supply enough blood to the stomach. All functions in the body suffer as a result of a deficient blood supply and the stomach is no exception.

Gastritis Is Overworked Term

Another abused term is gastritis. This condition does not really exist unless some caustic poison like lye or some irritating, poisonous drug like carbolic acid, arsenic or bichloride of mercury is taken in large amounts, usually with suicidal intent. A painful and drastic condition follows the swallowing of these drugs because of the fact that the delicate lining of the stomach has been literally burned off. If the patient survives there will be long continued disability, and this condition is known as gastritis.

Another cause of gastritis reflecting itself in symptoms of indigestion is the excessive drinking of alcohol. The mucous lining of the stomach is a delicate membrane, which suffers much from the abuse of imbibing alcoholic beverages of an inferior quality. The drinking youth of today are ruining their digestions.

Since pain in the stomach may be due to heart disease or to disorders of the many organs sur-

rounding the stomach, a physician is the only one qualified to weigh the facts from the history, symptoms and by physical examination and so determine the cause of the trouble.

Pain may be due to an ulcer of the stomach. It varies in this disease depending on the depth of the ulcer, its location and the amount of inflammation present. There may be severe pain before eating or, at other times, after eating, depending upon the location of the ulcer. An ulcer of the stomach may bleed or perforate. When an ulcer perforates, there is sudden and intense pain and the abdomen becomes as hard as a board. Sometimes these symptoms come on without any warning; at other times there is a long history of stomach disorder. Occasionally these ulcers bleed and patients have been known to bleed to death from these concealed hemorrhages without warning. One can readily observe from such catastrophes how important it is to place oneself under expert care when stomach disorders are present.

Immediate death may also occur from so-called indigestion as a result of rupture of the pancreas. The pancreas is the organ that deals with the effects of improper balance of food, and is the organ at fault in patients suffering from diabetes.

Stomach Reflects Disorders in Other Organs

The stomach is only a link in the chain of the important organs surrounding it. In close vicinity and intimately connected with it are the liver, spleen, pancreas and about 28 feet of intestine. The liver receives the products of digestion from the spleen and other organs. In turn, the liver manufactures bile, which is poured into the intestinal tract just beyond the stomach, bile being an important factor in the digestion of food after it leaves the stomach. The liver also makes other products that assist digestion but these do not concern us here.

The stomach is in continual motion, especially after food is eaten and swallowed. If there is any derangement of one link in this chain reflexly it is felt in the stomach. The liver may not be acting properly, manifesting itself in the so-called biliousness of some patients. Bile is often vomited and intense headaches accompany these disturbances of metabolism.

The two organs that give rise to the most frequent reflex stomach symptoms are the gallbladder and the appendix. The gallbladder plays a more important part than the appendix. In persons, especially women who have borne children, suffering from paroxysmal pain, distress after eating, some nausea and occasional vomiting the physician immediately suspects the gallbladder.

The appendix is responsible for many of the ills referred to the abdomen. When chronically inflamed, it gives rise to symptoms referable to the stomach. There is, in addition to pain in the right lower part of the abdomen, distress in the stomach. The appendix, whether acutely or chronically inflamed, should never be ignored. At such times the use of purgatives is dangerous.

The most insidious affection giving rise to disturbances designated indigestion is cancer of the stomach. In its early stages it is one of the most difficult diseases to detect. Cancer of the stomach is unquestionably on the increase, attacking individuals in the prime of life. Symptoms come on stealthily with slight nausea, belching of gas and some pain, and gradually become intensified. There is loss of appetite, especially an aversion for meat, and a consequent loss of weight. A ruddy complexion changes to a muddy one. It is then too late to help by means of an operation.

Preventing Abdominal Crises

How can we prevent these catastrophes? In a person 40 years old or over with these persistent symptoms much can be done by having an x-ray examination every six months, in addition to other tests that suggest themselves to the alert physician.

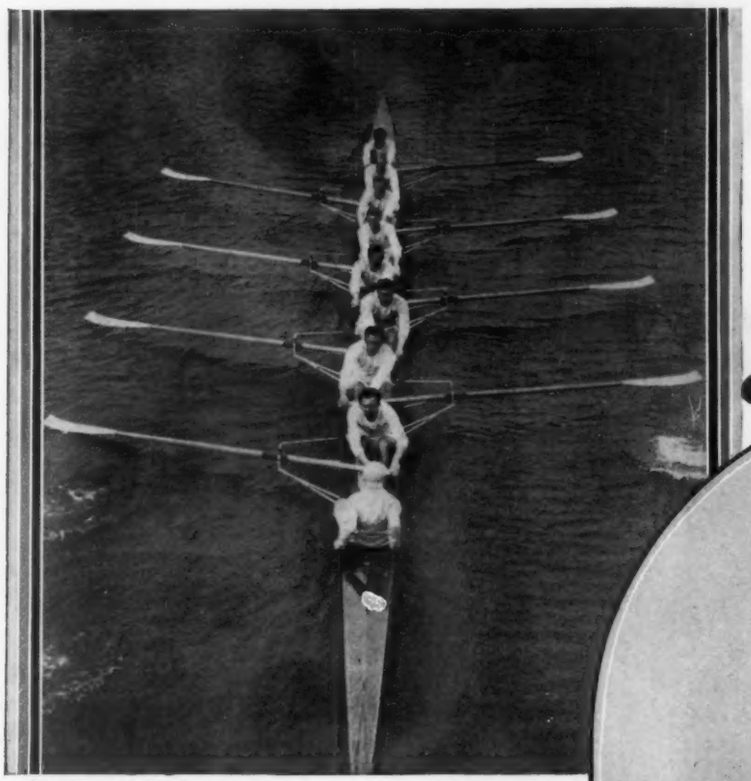
This naturally leads to a discussion of the harm that is perpetrated daily by quacks, with the assistance of some of our daily papers. One advertisement especially obnoxious is the recommendation of certain products emblazoned with the pictures of so-called doctors. Advertisements of this kind hold out hope to the patient that an inert something will benefit him. It often happens that the patient in the first stage of cancer tries these advertised remedies. This is calamitous, because cancer wherever it is situated must be reached early by the physician. It does not matter so much how relief is applied, whether by x-rays, by radium or by surgery so long as one of these measures is used when the early signs manifest themselves. In contrast to these fake advertisements, constructive advice is contained in the recent advertisements of a reputable drug house and of a life insurance company.

Much can be done to reduce the many cases of stomach trouble by regular visits to the family physician for an examination of the entire body once a year or, better still, once in six months. If symptoms are active one should consult his physician oftener. Periodic health examinations have done untold good in detecting ills of which the person never dreamed and which can be corrected before they have reached a dangerous stage.

Surgeons are accomplishing remarkable operations on the stomach. A third, a quarter, a half or the entire stomach may be removed and still the patient may live, provided the cut end of the stomach is joined to the intestine. So we see that surgery with our present-day methods can do wonderful things in relieving and curing the symptoms of so-called indigestion.

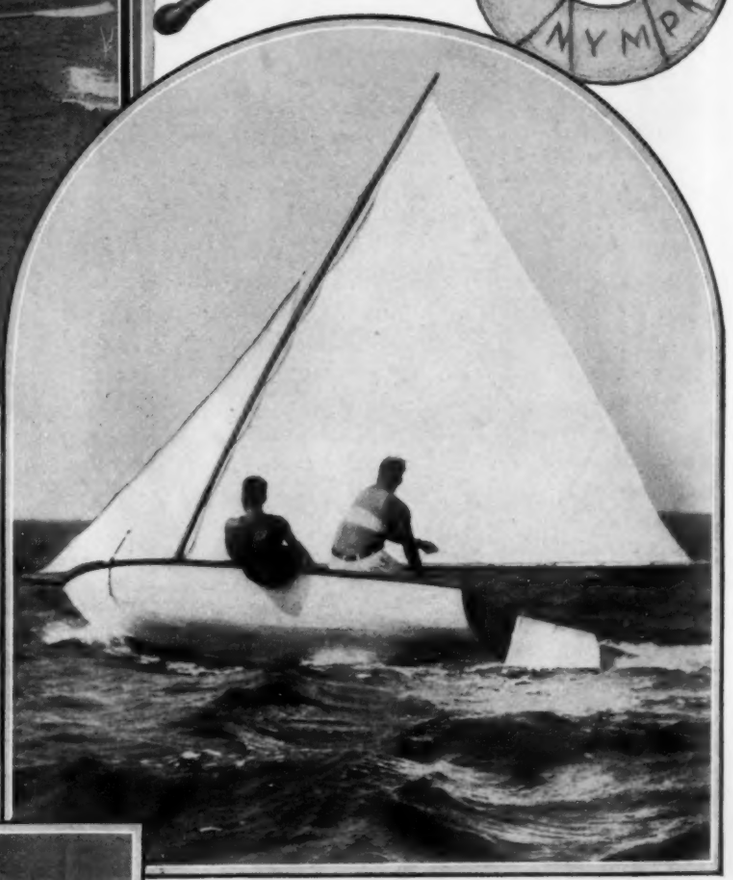
Holidays Are Here Again

All photos by H. Armstrong Roberts



Underwood and Underwood

Still Waters and Lively



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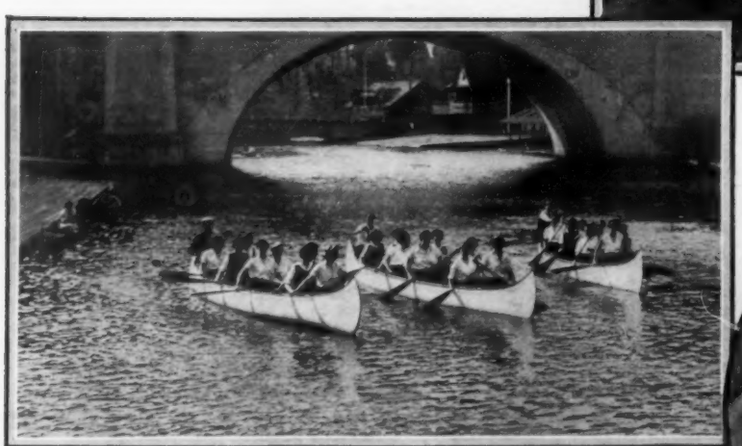


Underwood and Underwood

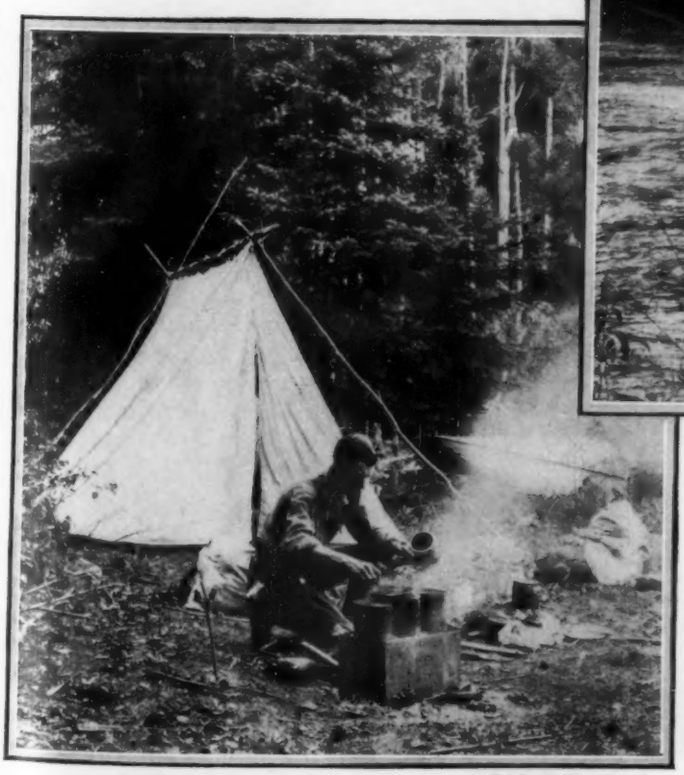
H. Armstrong Roberts

Forest and Fishing
A Man's Vacation Ideal

Ewing Galloway

Richard K. Wood

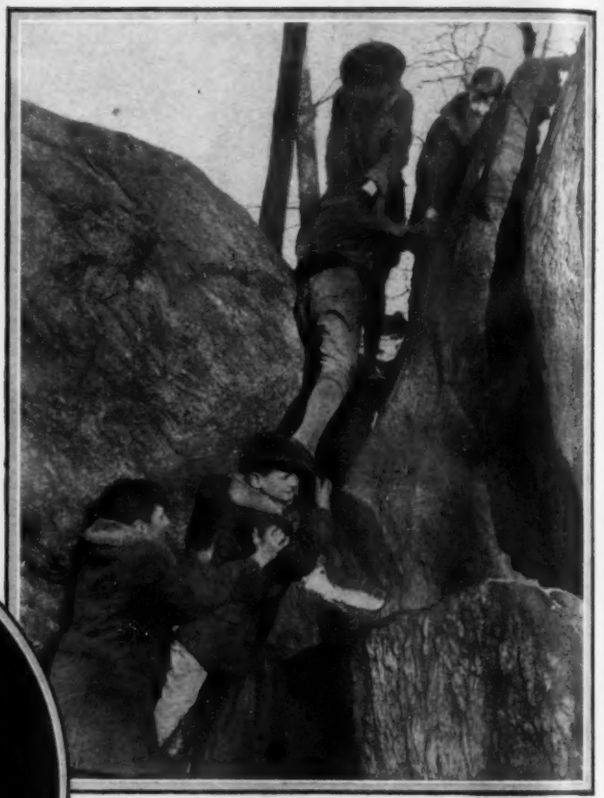
Ewing Galloway



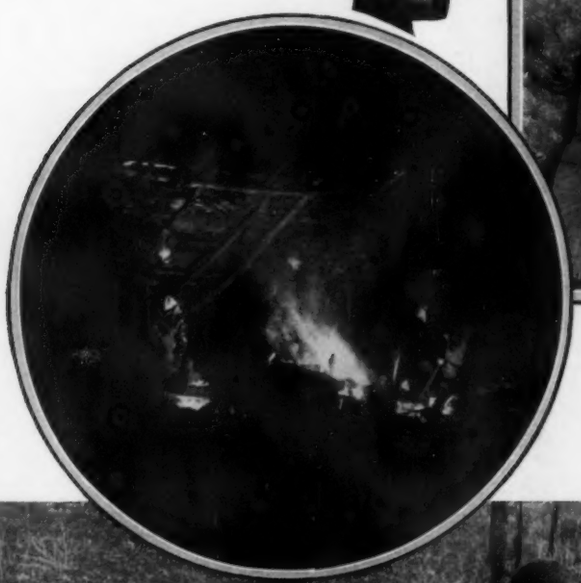
Richard K. Wood

Good Scouts All

Ewing Galloway



Ewing Galloway



Underwood and Underwood

Ewing Galloway

Preventing Painful Feet

By Guy A. Caldwell

WHEN this nation examined its young men for the draft in 1918 it was appalled at the large proportion who were physically disabled by their crippled feet and, if the women had been examined, I dare say most of them would have been rejected. Partial disability from foot trouble, prevalent and increasingly prevalent as it is, usually is preventable. Ignorance of simple foot hygiene and general acceptance of widely advertised shoe styles, arch supports and corn remedies are largely responsible for most of our crippled adults.

No infant ever was born with a bunion or a corn. The rare clubfooted baby is about the only example of congenital foot trouble. Disabled feet are acquired and their beginning is too often connected with the feeding difficulties so common at the time babies begin to stand alone and walk. Soft bones and relaxed joints are frequently associated with overweight in the 10 to 15 months old baby who has been taking an unbalanced diet. The too chubby baby so proudly exhibited because he is walking at 9 months is often doomed to suffer with his feet in later life. Ignorance of the proportions and quantities of the essential food elements needed to strengthen the baby's muscles and bones without increasing his body weight too rapidly just as he is beginning to stand often causes bowlegs, knock-knees and weak ankles, together with their adult sequelae of painful feet and aching legs.

Common sense fortunately still overrules Dame Fashion in shoe styles for children. Practically all children's shoes are built with flat heels and ample width and length for the toes. The foot pains of childhood are, therefore, usually due to shoes having become too short because they were worn after they had been really outgrown or to overweight or weak leg muscles. Most children pass through adolescence into early adult life with sound feet but trouble then soon besets them, especially the girls.

All high heeled shoes in effect are too short for their wearers. They are worn for the sole purpose of making the feet appear smaller than they actually are. Under weight-bearing the bones of the foot slip forward and downward in the flesh, which is held in place by the high heeled shoe. As the bony foot is driven downward by the body weight, the toes are crumpled under the narrow toe cap, the constant friction produces corns on the tops of the lesser toes, a bunion over the great toe joint and a bunionette over the little toe joint. As the big toe is jammed forward by this downward force, it is also pushed outward by the pointed toe of the shoe, causing the valgus deformity which goes with a bunion. Because of the constant pressure against the inner sides of the great toes, the wearer finds herself toeing out as she walks.

Toeing out when wearing high heeled shoes causes two thirds of the body weight to fall on the big toe joint instead of the one third that falls on it when the weight is properly distributed to the heel and little toe side of the foot. So much weight is thrown forward and in front of the natural ball of the foot that it strains the ligaments supporting the transverse arch of the foot, irritates the joints and causes cramping and burning of the toes.

Several years of wearing high heeled shoes necessarily results in shortening the muscles in the calf of the leg which are attached to the heel bone. If then the repentant wearer determines to adopt flat heels suddenly, she immediately experiences great pain across the arch of her foot and running up the strained muscles of her leg. Because the shortened leg muscles cannot immediately stretch out and accommodate themselves to the lowered heel, there occurs a compensatory tremendous stretching of the muscles and ligaments protecting the longitudinal arch of the foot. Then follows the so-called flatfoot or broken arch.

The popular conception of the broken foot arch and its correction seems to be linked with the idea of a broken arch of masonry and its repair by a curved steel band for support. Such a mental picture is erroneous and misleading. The integrity of the arch of the foot under weight-bearing depends on the strength of the leg muscles, the tendons or leaders from the latter looping under or spanning the arch in such a way as to sustain it and carry the real strain. Fatigue or weakness of the leg muscles therefore permits a sagging of the bones composing the arch of the foot and the sagging in turn strains the inelastic small ligaments which hold the bones together, and results in pain. In this connection it should be remembered that weight rapidly gained without a corresponding

gain in strength in the leg muscles results in relative weakness and inadequacy of the latter to support the arch of the foot.

Arch supports and corrective shoes have their place in the treatment of pain caused by arch strain but they cannot build up muscle strength, reduce weight or correct faulty habits of standing and walking, all of which are frequently required really to overcome such foot trouble.

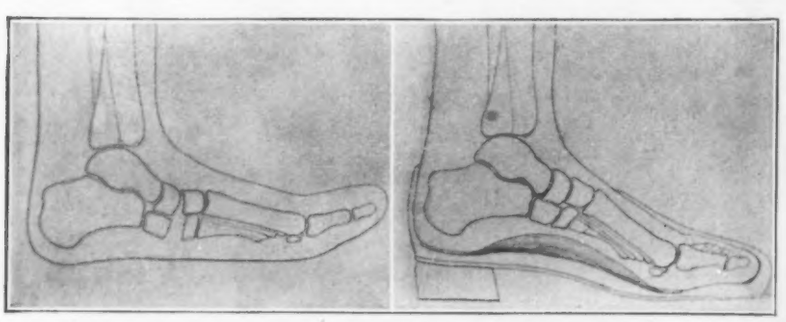
Painful feet oftentimes result from various causes other than arch strain. Various types of rheumatic involvement of the small joints, nerve disturbances, skin diseases and grave circulatory disturbances are frequently ushered in by the symptoms of pain in the feet. Many such cases tax the skill of the best physicians and specialists to establish a diagnosis and institute proper treatment. Because serious constitutional conditions often produce foot symptoms similar to those of arch strain, it is hardly good judgment to consult a shoe salesman, a chiropodist or a so-called "foot specialist" representing the makers of patented arch supports of various kinds. Such people are in business and must sell their wares. They have but a limited knowledge of a few of the commonest arch troubles and their ignorance of the physiology and pathology of feet renders their advice not only worthless but sometimes actually dangerous.

Many of our grandmothers taught our mothers that it was bad form for a girl to walk with her feet placed parallel and that she should toe out. This teaching was wrong and has caused many foot aches. Children and adults should learn to walk placing the inner borders of their feet parallel to a straight line and not toeing out. Parallel walking helps the body weight to fall over the center of the foot and to be equally distributed to all parts of it. One should not plod along but should walk with some buoyancy and spring, bringing all the muscles of the legs and feet into play. The sole of the shoe should be gripped by the toes at each step. Correct walking builds up the muscular support of the arches; incorrect walking strains the arches and weakens essential muscles.

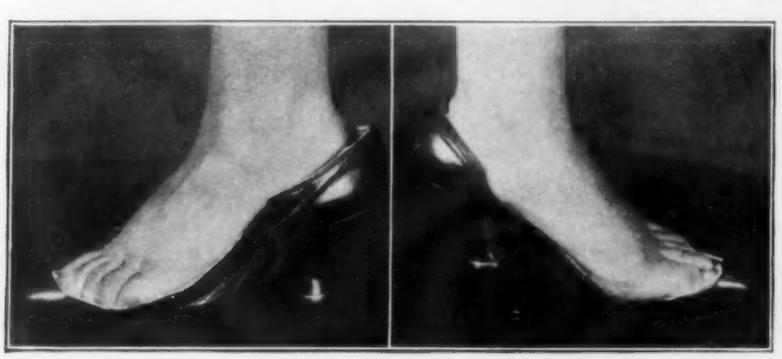
Most of the skin troubles affecting the feet could be prevented by the simple expedient of a thorough cleansing with warm water and soap each day and donning fresh socks or stockings. Flat warts, which are quite painful, sometimes occur at various points on the soles of the feet and are mistaken for calluses. They should be destroyed by x-ray or radium applications and will not respond to corn plasters or trimming by the chiropodist.

The prevention of painful feet should begin in infancy with strict control of the age-height-weight ratio by a properly balanced diet. Control of the weight, attention to correct habits of standing and walking, and regulation of exercise should be continued throughout life if foot troubles are to be avoided. Correct foot gear is absolutely essential to painless feet, and no heel that is higher than those on men's shoes should ever be worn for walking or standing. The daily foot bath with warm water and soap, followed by clean socks or stockings, cannot be dispensed with safely.

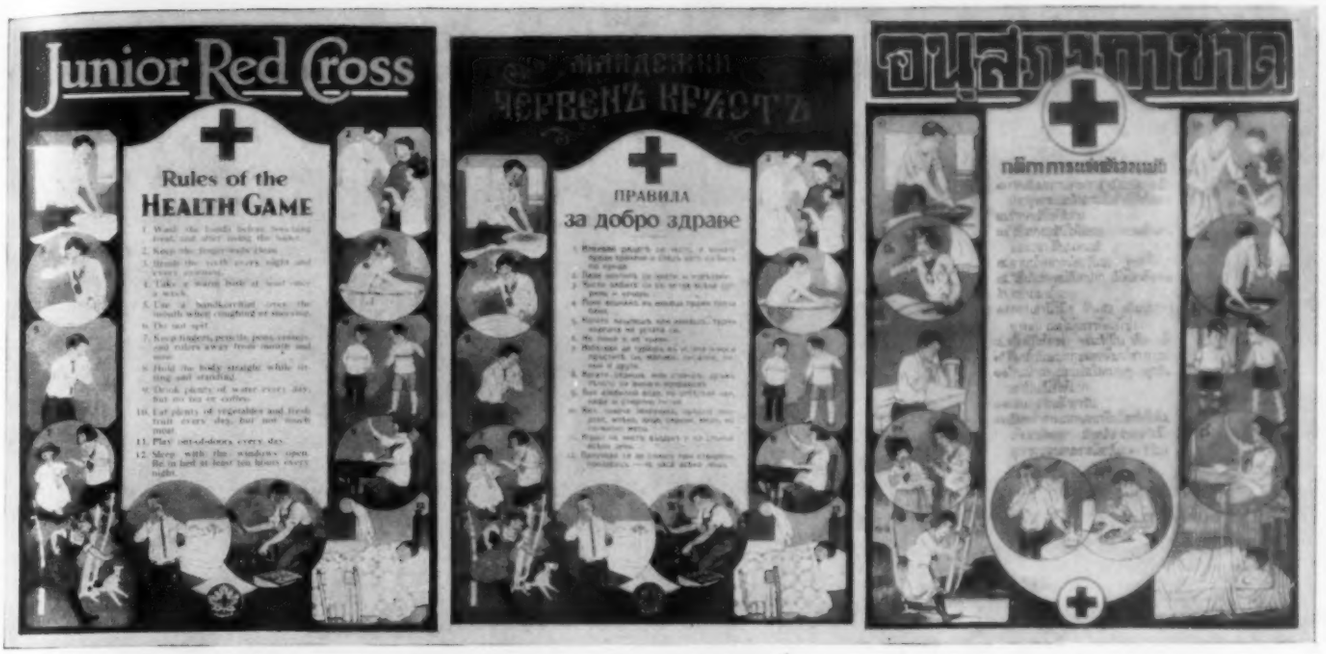
If pain develops in the feet the examination and advice of a physician should be had before buying arch supports or corrective shoes.



Above, at the left, the popular but incorrect conception of the broken arch. At the right, arch supports usually recommended by shoe fitters as the only correction necessary for painful feet.



High heeled and ill-fitting shoes crumple the smaller toes, produce corns on top of them and force the big toe outward. The foot slips forward into the narrow part of the shoe, forcing the big toe outward and compressing the big toe joint, producing a bunion.



A Canadian poster undergoes interesting changes as it is adapted to the customs of Bulgaria and Siam. The "weekly" bath becomes "monthly" or "twice daily."

"Another Man's Poison"

THE CANDID CONFESSIONS OF AN INTERNATIONAL HEALTH WORKER

By Charlotte F. Kett

BATHS, inside and out, no tea or coffee but plenty of milk, fresh fruit and vegetables, fresh air and sunshine are but a few of the planks in the nursery platform, and a sound, firm structure they are likely to build, given good material and adding plenty of rest. But universally applicable around the world they are not, not at least till the millenium dawns—and even then there will be variations.

As art is international to a very limited extent, so also, one discovers at any international office working for health, is hygiene. Each country, each district even, if life is to go on, is obliged to develop those habits that reasonably suit its needs, and while these at times may make us smile, there is no reason for the smile to be a sneer.

I think as I write these words of a momentous day in the Balkans—those "firebrand Balkans" that have bred so many of the wars and so many of the epidemics of Europe and the world. The school children of the United States had sent a present to the children of Bulgaria, a present of $500 which they had earned themselves. A Bulgarian committee had decided how it should be spent. As I was to be traveling in Bulgaria, the donors had asked me to send back assurance that the scheme had been completed as it had been planned.

The money, it had been decided, should be used to brighten up the schoolrooms of Bulgaria, those bare and dreary schoolrooms of that poor, war-ridden land. To this end a poster had been printed, gay with color; and because the gift was earned and given in the name of the Red Cross it was, naturally enough, a health poster.

A Canadian poster had been used as the model, though red-headed, blue-eyed children had been changed to black-haired, brown-eyed ones and the readable ten "Rules of the Health Game" in the center had been written in that phonetic alphabet invented in the ninth century especially for this people by those worthy brothers from Salonica, Saints Cyril and Method.

"Would you read the Cyrillic for me?" said I to a handy professor when the proof came in. "I am, you know, not the equal of your first-graders; I cannot decipher the alphabet."

A grasshopper hunt by the Junior Red Cross members in Japan. Below they are weighing part of their 3 ton catch, which they later sold as food.

"With pleasure," said he, and so he read and translated rules which closely paralleled the Canadian decalogue—with the exception of rule 4.

Canada's reads: "Take a warm bath at least once a week." The Balkan adaptation ran: "Try if possible to take a monthly bath." I opened my mouth, but no words came. If this meant cleanliness to them it was not for me to impose my views. "Criticize not that ye be not criticized," thought I, and it is well that such a thought came to me, for there was a sequel to this tale which reenforced the moral it pointed!

A year later came the selfsame poster, reedited in Siam with the round, occidental, pink-cheeked types turned into lean young Siamese and the printed "Rules of the Health Game" more utterly illegible than they had been even in Cyrillic characters. My curiosity was roused.

"Read it to me," I entreated my Siamese colleague, keeping my ears well open when she reached rule 4.

"Take at least two baths a day," she read in clear English.

Siamese Cleaner than We

Perhaps I gasped, for she turned to explain: "You see, we have a tropical climate and much water. Your 'Saturday night' tradition strikes us as—well—as inadequate." She is one of the most polite persons I know, polite with that oriental graciousness that comes from the heart; otherwise, I felt, she might have put it much more strongly. Yes—seeing the human family as a whole tends to limber up the mind and to relieve it of a number of preconceived ideas!

Never shall I forget the electric charge in the atmosphere one day at an international gathering at Bedford College in London when a health pioneer from Finland, far up on the edge of Russia, was telling a stirring tale of the lives that had been saved in her bleak, relentless territory because the school children had been taught what to do in an emergency.

Drinking Tea in Finland

One story she told was of a small child desperately upset—some sort of dysentery, I gathered. The village dames desired to dose the child with unclean potions of a nameless kind. "No," insisted one of the nurse's small students who was present, "he must have nothing but hot tea—nothing, nothing, until the nurse can come." And so sure was she that her will triumphed, and the child's life was saved and the grumbling neighbors were silenced by the outcome.

On the telling of this tale the air bristled with disapprobation. The Canadian nurse shot up: "Do you, in Finland," she asked, with all her

professional dignity to the fore, "allow young children to drink tea?" Then came the torrent of explanations. Tea, if it merits the name, is made with boiling water; boiled water is safe

A primitive shower bath in Serbia, before the proceeds from the sale of a pig brought about "modern improvements."

water, and tea on the edge of Russia is a steaming amber liquid in a glass, a remote relative indeed of the deep caramel-colored cupful that has behind it the full force of Anglo-Saxon tradition. Tea is a stimulant; tea deters dysentery. No, Miss Finland would not gainsay her pupil's tea for all the contrary beliefs of America! And was she wrong? In any case the patient lived.

From China comes a similar account. To counsel "at least four glasses of water a day" to Chinese children would be to ring the death knell of the nation. Far safer is their pale tea with its blessed history of being boiled.

Even Milk Is Variable

Then there is that other bugbear, coffee. Many an American Red Crosser was horrified during the war at the French child's breakfast of coffee and bread. But it was largely horror wasted, for, though coffee in the United States is much coffee and a little cream, in France milk and chicory form the basis of the breakfast brew and there is often only coffee enough for christening purposes.

Then, too, how variable a substance is that standby, milk, ranging as it does from goat's or cow's milk and the "canned cow" of ordinary acquaintance through many forms, even to bean milk, on which, my Chinese friends assure me, their almond-eyed infants lustily thrive.

The taste for some of these milks is, I find, like the taste for olives, something to be acquired. "Will the honorable lady join us in our morning cup of milk?" is an invitation that it is difficult to accept wholeheartedly when it is tendered you in the middle of Macedonia and refers to sheep's milk—a strangely acrid beverage. It is less difficult to be gracious in Asia Minor when one is invited to partake of a bowl of yaourt, being assured that it is very good indeed, being made of "the best buffalo milk." Let those who live where pure milk chilled, cleanly handled and delivered is easily available render due thanks for their blessings!

When we consider those other essentials to health—fresh fruit and vegetables—there is relativity indeed! We have first, of course, the relatively fresh food to which many of us are doomed by our fate as city dwellers, but there is also the relative respect that mankind has for these commodities because of the positive danger that lurks, in some parts of the world, on the humble lettuce leaf or the alluring strawberry.

"Eat some raw fresh food every day" is admirable advice for the healthy children of favored climes, but there are vast sections of the earth's surface in which we have to add "when it is available" and there are others in which, despite the sacrifice of vitamins, it has to be stated the other way around. "Eat no vegetables or fruit that have not first been cooked," in order that life itself be saved.

We all have our dietary prejudices. Take my own, for example. Although I have never tried the famous ancient eggs of China or the rats of Central Africa, I had thought I should find equally distasteful bird's nest soup—until I tasted it! It is delicious, for the birds' nests are of seaweed built in caves along oriental coasts, and lazy, sunlit memories of all the southern seas seem to hover on a bowl of soup they have flavored.

Having overcome this squeamishness and having learned to like the garlic-flavored snails of the Burgundian gourmet, I was surprised at my lack of responsiveness to a description of the fine flavor of candied ants, a dainty much esteemed along the Amazon, I'm told. For, after all, if snails and shrimps why not ants? Provided of course that they are the luscious mammoth variety of delicate savor.

Grasshopper Scourge Turned into Blessing

And if ants, why not grasshoppers? Have we not biblical precedent? Not that that mattered two years ago to the Japanese youngsters. It was purely a business matter with them, busi-

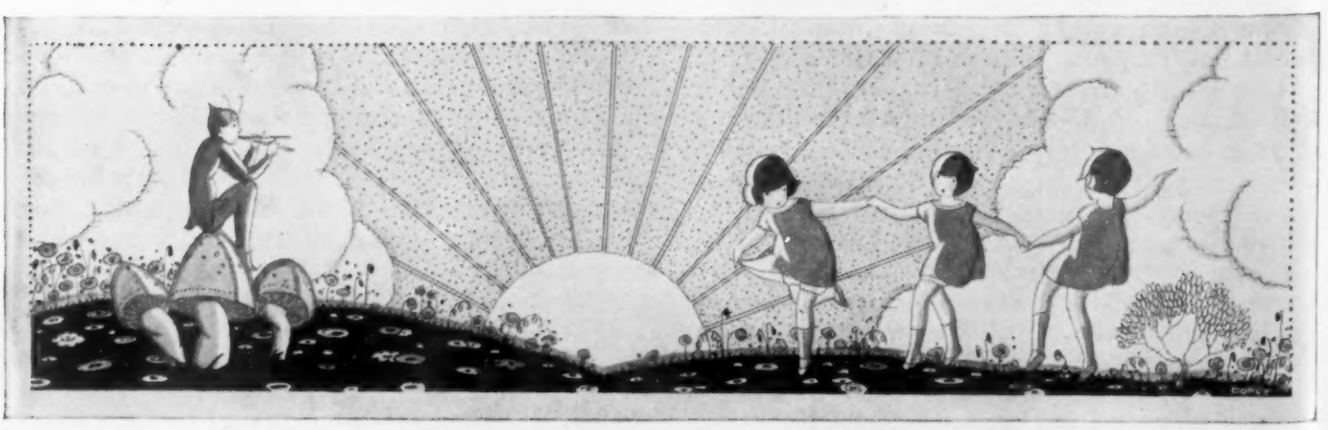
ness prompted by civic devotion. The fields were being devastated by locusts. Could they not, in their thousands, catch millions? They could and they did! It was but a question of organization. But there their civic devotion came to an end. The rice fields were saved from total destruction, but what to do with the harvest of insects? They had tons of these wing-weight things. They decided to sell them for food, and sell them they did, using the money for holiday camps for the sick and the poor, thus turning a scourge to a blessing. Do not the philosophers tell us that every quality contains its opposite?

But the way in which the pig was made to illustrate that fact was best of all. He was a Serbian pig—a very young, pink pig residing in an undistinguished village. Worse even than that, he came as close as a pig can come to not being wanted, and when donations were in order for the newly formed group of the Junior Red Cross, this young pig was given to the village school. It is doubtful if even in such surroundings he learned a lot. He was well fed by the children, who brought scraps from home. The pig grew and waxed until the day came when he could cut a fine figure—and bring a fine figure—at market. This he did.

The money thus gained furnished funds to buy boards and pipe and nozzles, so that gasoline cans could be stood in a row on a shelf in a shed and transformed into showers. For towels the children brought the strips of hand-woven linen that custom decreed they receive if ever they helped at a funeral.

So it was that a pig, symbol of filth, served to clean up those youngsters, thus adding his bit toward those ends to which an army of children twelve million strong are devoting their efforts in school and after school in forty-six lands—"the improvement of health, the prevention of disease and the mitigation of suffering throughout the world." Could either pig or child—or adult either, for the matter of that—serve in a better cause?

Hungarian juniors and their Red Cross cow. The underweight children drink the milk.



The Right Kind of TOYS

By Myrtle Meyer Eldred

Photos by H. Armstrong Roberts

Sonny needs proper tools and materials for his pet construction projects.

WITHIN comparatively recent years parents have come to look upon the child's play and his toys with the respect to which they, as stimulants of healthy mental and physical growth, are entitled. Heretofore children had toys, it is true, but they evolved from necessity, not wisdom. The child had to do something, said the parent, so he was given a rattle, a ball, a doll and a wagon, without much thought as to their respective uses.

Toys Should Help Child Develop

We did not know that by our accidental choice of certain fun-makers we, as in the case of the rattle, developed the baby's sense of color, his knowledge of various kinds of surfaces, his recognition of shapes and his discrimination of sound.

Having arrived at a recognition of the benefits that could be derived from the wise choice of a toy, we moved on to the next stage, which was a critical one. What toys had no obvious benefits? Soon we began to look at all toys from the point of view of whether or not they catered to the development of the child's senses, promoted the activities that his growing body demanded, or encouraged him through play to imitate adult activities and adult attitudes of sportsmanship or ethics. If a toy is a good one, it will fall into one or another of these classes. Any other toy is a poor investment.

Small children need very large blocks

The average girl of runabout age will have a doll. She will have materials with which to sew doll clothes and she will have magazines from which she can cut a paper family, supplied with enough clothes to lead a comfortable existence. That isn't enough. Small children, girls quite as well as boys, should from the ages of 3 to 7 devote little time to movements that engage the finer muscles. The muscles used in sewing and delicate cutting operations are not developed for that work until the child is between 7 and 9 years old, and it is a mistake to be enthusiastic about the prowess of the kindergarten child in making intricate dresses for her dolly. She had best be kept busy in games and activities that exercise and develop the larger muscles, in running, climbing, kneeling, bending, skipping, pulling and lifting.

Girls are far too often satisfied with these placid activities, and adults should refrain from giving a child a sewing outfit until she can harmlessly make use of it.

Need to Climb, Lift and Jump

With boys our chief lament is to find enough harmless objects upon which they can work off their desire to climb and pull and lift and jump. If apparatus is not provided for their amusement, they manage anyway.

One father was driven almost to the point of distraction by his 2 year old son who climbed upon everything in the house. The boy was as likely as not to be found draped on the linen

Grandma teaches the art of baking her famous cookies.

closet shelves in a perilous attitude, and he rode on the backs of chairs and climbed the open chiffonier drawers in a manner that defied gravity.

If the father had ceased being distracted and had spent his time building some steps up which the baby could climb, or a simple ladder fixed firmly to the wall, or a high box against which could be placed a wide, solid board, there would have been a natural and harmless satisfaction for the child's yearning muscles.

Lessons in Stair Climbing

It is surprising with what interest and concentration a child will climb up and down stairs if given the chance. Instead of making use of the stairs and teaching the child, from the moment he begins to walk, how he can safely negotiate them, the parents prefer to carry the child up and down and then bewail his substitute climbing activities.

Going up and down stairs is no more difficult for the child than many other lessons he has to learn. He can be shown how to sit down and flop from step to step, and how to hold tightly to the rails going up, but as soon as he can walk up and down without too much peril to himself he should be allowed to do so.

All parents observe the delight with which a small child lugs some object that looks far too large for him. A beloved small chair will be carried from room to room, a cart will be laden with blocks and books and pulled all over the place. This, too, satisfies a natural craving. The muscles of pulling and lifting need exercise and the ideal block for the small child is not a delicate affair which he throws around, if he looks at it at all, but a large one, six or more inches square, which it takes effort to lift and pile up into satisfying solid structures. These large blocks have a dozen uses; among them, the pure joy of lifting and carrying them and the good usable structures into which they can be built by forming them into play wagons, walls and steps.

Throwing Games

So far the parent observant of the child's needs has provided him with stairs to climb and objects to lift and pull. But what about throwing? It fills the mother with despair when her offspring begins to throw his toys on the floor and in time to increase his range of interests by badly chosen household gods. It may be fun for the baby to throw a delicate vase on the floor and listen to its delightful crash but his mother views these activities with biased eyes.

When this stage arrives, preserve the household treasures by providing the baby with something to throw that is just as amusing and not so destructive. Bean bags are fine (outdoors); and hard rubber balls can come later when catching the ball adds to its delights. In the house the child can play with bags stuffed with scraps of paper so that they have weight enough to throw without being dangerous to walls or furniture. And when baby begins to throw, make a game of it instead of calling it mischief and feeling that some punishment should be devised for its speedy demise.

As such a large share of the child's day must be spent outdoors we haven't fulfilled our duties until we have provided active outdoor amusements for the child. When he stands at the door and whines to be let in after only a few moments in the open air, we may be sure his outdoor play is devoid of interest. Instead of scolding him and bewailing his houseplant propensities, take a look at the back yard or the square of cement and discouraged grass that plays at being a yard and see its obvious deficiencies from the child's standpoint. At small expense great improvements can be made.

The child likes to imitate every activity of the home.

First in the list of outdoor play apparatus must come a sandpile. Sandpiles can be managed almost anywhere and if kept nicely boarded in even the landlord will be willing to allow one in the back yard.

Sand must be clean so that it packs well. It should be clean enough so that the baby who is just walking can put his bare toes into it and walk joyfully on its yielding surface. It should be sheltered part of the day from the sun and part of the day subjected to its healthful rays. Don't put it in a corner that never sees the sun, but preferably where the morning sun will warm it and it won't be too punishing for afternoon play.

The next and simplest of play equipment is a swing. It needs only a stout limb, a good smooth rope and a seat in which holes have been bored in the four corners so that it can at no time dump its unwary rider to the ground. Steel uprights with a horizontal cross bar can replace the tree, and if one goes to this trouble and expense the cross bar should be wide enough so that the swing can be accommodated at one end and the other end utilized for flying rings or for a bar upon which the embryo acrobat can chin himself and turn.

All the play apparatus so essential to the child's healthy physical development can be made at home by the father or can be purchased ready made from manufacturers catering to the child's needs. If there is a playroom set aside for the child, one can purchase gymnasium sets, ladders of various heights, steps that may lead to a playhouse on a higher level, all in the interest of encouraging the kind of play that will give a child natural outlets for his consuming muscular energy.

Imitating Adult Activities

Observant parents are not going to be content simply with providing play apparatus; they are going to keep an eye on their small sons and daughters to discover in what their chief interest lies. When a mother finds her small daughter hanging over her breathless with interest as she bakes a cake, she is going to buy a small mixing bowl and a spoon suitable to the child's hand, some sample packages of cake materials and show her how to mix and bake an edible cake. If young son yearns to make a corner bookcase, he should have the proper tools and materials with which he can mark out and saw this desired object.

Photos by H. Armstrong Roberts

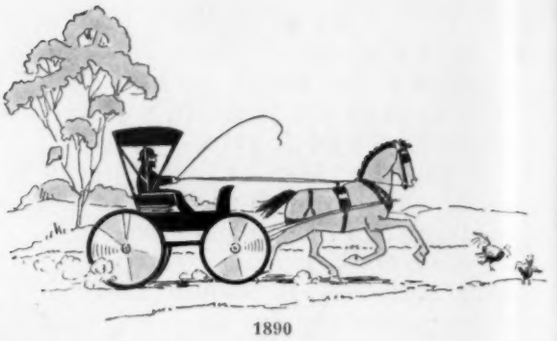
Sewing and delicate cutting operations should be left to children from 7 to 9. The kindergarten child is too young to use the smaller muscles in making intricate dresses for her doll.

The alert child is interested from eighteen months on in imitating every single activity of the home, and he needs the toys that will make it possible for him to practice these adult activities in the miniature form most suited to his size.

Treat Child's Toys with Respect

Let us be respectful of our child's play apparatus, and never look upon toys or childish games or dolls or buggies or balls, commonplace as they all are, as simply mediums for keeping the child entertained until he is old enough to drop such foolishness. Nothing could be more short sighted, for through his games, through his play and the manipulation of his various toys he is keeping himself busy, active, healthy and is molding his body and mind into their future adult form.

1870



1890

Why There Is a Shortage *of*

A CAREFUL and continuous study in regard to the supply of physicians in rural communities has been in progress during the last fifteen years. The study was given increased impetus in 1917 when the American Medical Association was cooperating with the medical department of the United States Army in the stupendous task of securing about 30,000 medical officers to accompany the proposed army of 2,500,000 soldiers to serve in the World War.

In connection with this work a statistical study was made of the physicians practicing in every county of each state showing the numbers who were over 55 years of age and of those under 45 years, since it was from among the latter group that the essential medical officers were to be selected.

Biographical Index of Physicians

Meanwhile, the only complete biographical list of all physicians in the United States was at the headquarters of the American Medical Association and, in a routine manner, the names of all physicians applying to the War Department for commissions as medical officers were submitted to the American Medical Association, where their medical qualifications and other biographical data required by the United States Army could be checked.

One of the requests made by the War Department was that, if any physician applying for a commission was the only one available within a reasonably large area, a statement to that effect be sent to the War Department. In each case the physician would not be granted a commission unless a substitute practitioner could be obtained. This substitute might be a physician who, because of age or physical disability, was ineligible for army medical service. Meanwhile, only one such instance was called to our attention during the war and an older physician volunteered to practice in the district so the younger man was free to enter the army medical service as he desired.

Fewer but Better Medical Colleges

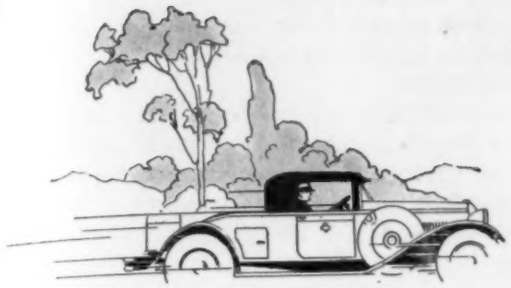
During the two decades prior to the World War, many improvements had been brought about in medical education, and entrance requirements to medical schools were raised to include two or more years of college work. During this campaign, there were numerous mergers among medical schools in different cities, resulting in a marked but beneficial reduction in the numbers of medical schools as well as of student enrolments and of graduating classes. Nevertheless, the number of better qualified medical schools, students and graduates was continually increasing. The physicians who were being graduated were much better trained.

In spite of the higher educational standards and the reduced number of medical schools, the numbers of both medical students and graduates are once more rapidly increasing.

One of the results of the improvement in medical education was that many new and improved methods of diagnosing and treating diseases were established. In consequence, there developed a tendency on the part of the well-to-do

Medical Colleges, Students and Graduates
Twenty-Six Years' Progress

Year	*Medical Colleges*	*Students*	*Graduates*
1904	160	28,142	5,747
1910	131	21,526	4,440
1915	96	14,891	3,536
1919	85	12,930	2,656
1920	85	13,798	3,047
1922	81	15,635	2,529
1925	80	18,200	3,974
1926	79	18,840	3,962
1927	80	19,662	4,035
1928	80	20,545	4,262
1929	76	20,878	4,446



1910

1930

Country Doctors

An Explanation by N. P. Colwell

country people to seek physicians in nearby cities who were believed to possess a better knowledge of medicine and a familiarity with the more recent and better methods of practice.

By the time the United States entered the World War, many physicians still practicing in rural communities had been deserted by many of their regular patients and were having difficulty in making a living. To such physicians the entrance of the United States into the World War brought a God-sent opportunity to leave such districts without being accused of deserting them. On the contrary, their action was looked upon as a patriotic service. After the war closed, many of these physicians did not return to their former addresses but, after obtaining advanced training in some chosen medical specialty, settled in new and more promising localities—usually in a town or city.

This sudden exodus of so many doctors from rural communities brought on what was heraided as a "shortage of doctors." Investigations, however, showed that this shortage was only in the rural communities as a result of the larger numbers who were locating in towns and cities.

Oversupply of Doctors in Cities

It was clear also that there was no dearth of physicians in the United States as shown by the fact that this country had a larger supply in proportion to population than any other country in the world. The scarcity of physicians in country districts, therefore, was more than offset by the overabundance of physicians located in the towns and cities.

It should be stated also that, as shown by census returns since 1910, there has been a general migration of people from rural to urban communities, so that in this migration some physicians naturally followed a portion of their patients to the city.

Other reasons that helped to bring on this shortage in rural communities were the telephone, the automobile and the development of cement roads. These developments enabled well-to-do country people to go or telephone to the supposedly better physicians in the nearby towns and cities and the physicians from the city when called by telephone were enabled to visit the patients with reasonable promptness because of the automobile and the improved roads. At first these roads were mostly those that led directly to and from the cities. The physicians in the country were still forced to drive over many bad cross-country roads, so that, even with automobiles, they were unable to compete successfully with the city physicians, especially in bad weather when the country roads were unusually bad if not impassable.

Increased Use of Hospitals

In the meantime, the standards of both medical education and medical practice were steadily advancing. The increased requirements of premedical education, the better equipment of medical schools and the closer affiliation of medical schools with hospitals resulted in developing physicians who were not only much better equipped educationally, but also, through the greater opportunities given them for the actual study of patients in dispensaries and hospitals, had developed greater skill. An appreciation of these facts further increased the tendency of the public to seek better trained doctors.

The more recent graduates, also, were inclined to locate in larger towns and cities because of their accessibility to larger numbers of patients, the better paved streets, and the telephone and street car services. Practice in such places was easier and more remunerative, since the physician could with greater facility visit or care for a larger number of patients than he could in

rural communities in which the people were fewer and more widely scattered.

Physicians have always been scarce in some mountainous or outlying districts in which, for various reasons, the people are more widely scattered and the roads are mostly unimproved and frequently impassable. Hence arose the important problem of extending clinics or hospitals farther into these rural communities whereby the benefits of the greatly improved medical service would be placed in the reach of larger portions of the population.

Should There Be a Retrogression in Standards?

For twenty years, a committee of the American Medical Association has been working with marked success toward raising the requirements of medical education so that the medical schools of the United States would compare more favorably with the high grade and well established medical schools found in the countries of Europe. But by certain individuals these higher standards were believed to be responsible for the shortage of doctors in rural communities and an agitation was begun for a return to the lower standards that formerly prevailed.

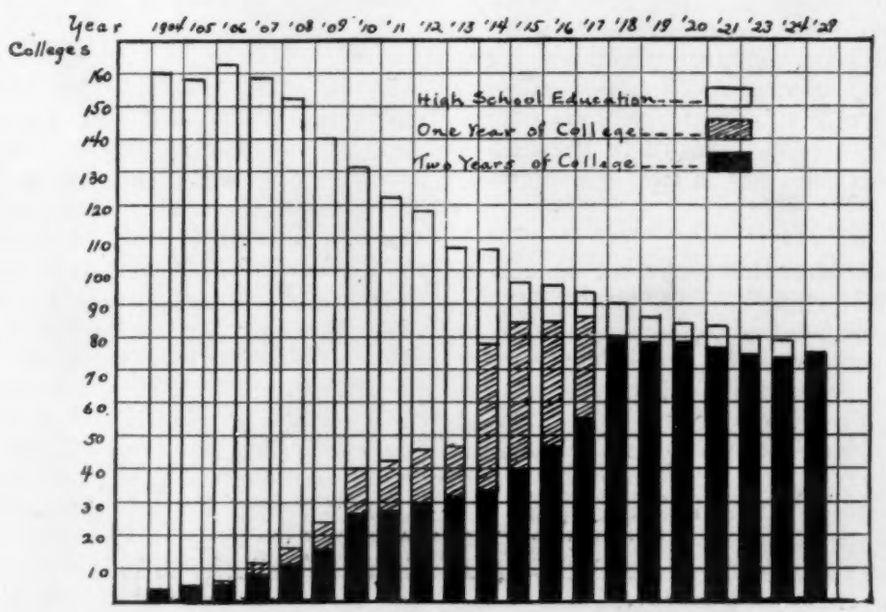
Early in 1922, in Kentucky, this suggestion was given a thorough discussion at a joint meeting of two committees representing, respectively, the Kentucky legislature and the Kentucky state medical association, where also were present representatives of the state licensing board and other guests. After the proposition for restoring low standards had been clearly set forth, a senator from one of Kentucky's mountain districts practically ended the discussion by clearly showing that "country folks had as much right to good doctors as city folks," and added that he "didn't want to see educational standards being lowered in Kentucky."

As a matter of fact, it has been clearly demonstrated that physicians would not go to nor could they remain in localities where they could not make a fair livelihood. It is evident also that the country's needs of better medical service would not be supplied by a return to lower standards. If a doctor is intending to practice in the rural communities he would need to have an equal or a better training than if he were intending to practice in the city, since he will need to be self-reliant. The lower the physician's educational qualifications, indeed, the more necessary it becomes that he remain in the city where other doctors may be called in consultation.

It must be recalled also that the shortage of physicians came about through the action of country people themselves in their search for better doctors who, in their belief, were in the cities. This being true, it is not likely they would patronize doctors who were avowedly given an abbreviated training in an effort to induce them to locate in country districts.

Development of Modern Hospital

Another important factor in the scarcity of physicians outside of cities or towns was the development of the modern hospital. The increased knowledge of medicine led to the adoption of more intricate and highly technical methods of practice. Surgery, formerly used mostly in emergencies or as a last resort, has



A chart showing the development of fewer but better medical schools in the United States.

come into everyday use. Also antitoxins, serums, vaccines, blood transfusions and the use of the x-rays and of radium has made the hospital not only an essential adjunct to a physician's equipment but also the safest place for the application of these more technical methods of treatment.

The hospital has now become generally recognized by the people as the safest place for treatment of any kind. Because hospitals were located only in the larger towns and cities, naturally the well-to-do country people had another valid reason for going to the city for medical care.

At the present time the problem is slowly but surely being solved by:

1. A further development of roads whereby the cross-country roads will be improved as well as those leading to the cities.

2. The building of hospitals in the more remote districts that have a large enough population to support them.

3. The location of small hospitals or clinics at the centers in which are located the larger and better graded schools as a result of the consolidation of rural schools. In the latter movement one enlarged graded school centrally located is being substituted for the score or more of the old time one-room schoolhouses with an ungraded curriculum and a single teacher. In this consolidation of country schools, furthermore, pupils are taken to and from their widely scattered homes by bus service, and this in turn requires that the roads radiating in all directions from the consolidated school must be kept in passable condition. The same motor bus that takes pupils to and from the consolidated school would also convey patients to and from a small hospital or clinic at the same center.

4. Another measure now proposed is that a hospital located at the center of any large rural district designate one or more physicians who would be sent out to see patients in emergencies or to accompany ambulances whereby the patients, if necessary, could be brought into the central hospital.

5. Already to an increasing extent airplanes are enabling physicians to visit patients even in the more remote localities.

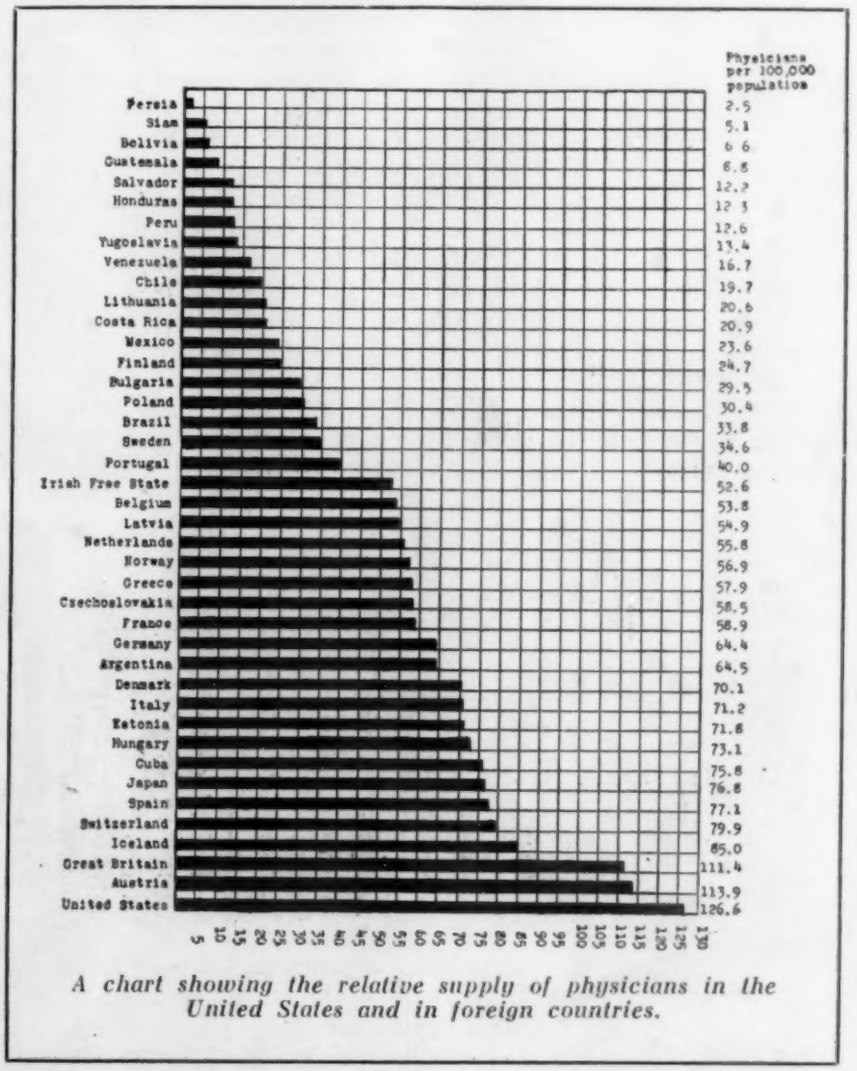
It will be seen, therefore, that the scarcity of doctors in rural communities was due not to an inadequate supply of physicians but to an unequal distribution, which, in turn, was due to actual progress being made in several lines of activity:

1. Advances made in medical knowledge, medical education and in more efficient methods of diagnosis and treatment.

2. Better facilities for communication and travel—developments of the telephone, improved roads, interurban cars and automobiles.

3. The development of the hospital as a place having facilities enabling competent physicians more safely to administer efficient care.

4. The abandoning by physicians of country localities as a part of the general drift of the population from the country to the city. The problem, therefore, cannot be solved by retrogressive measures but only by the further extension of progressive measures whereby the means of providing medical service can be extended farther into the rural communities so that a constantly increasing proportion of the people may have safer and more efficient medical care.



A chart showing the relative supply of physicians in the United States and in foreign countries.

An active, vigorous girl may sit on her foot with impunity, but not so the bookworm.

Physical Defects *and* Character

By Thurman B. Rice

II. Nearsightedness and Astigmatism

WHAT is the matter with the boy who makes wonderful grades at school but who does not fit outside? The child who is the teacher's pet and the other children's pest? It is not unlikely that he is nearsighted or has some other defect of vision that makes it impossible for him to do well on the playground but easy for him to read. Other things might be the cause, to be sure, but the eyes should be considered as the most likely possibility. Besides, it's so easy to be sure about the eyes and to correct the defect if it is found. Parents are often proud of the bookworm, but they should remember that such a child is a worm of quite a different sort on the school ground and out in life generally.

A moderate degree of nearsightedness will not hinder a child in the use of his eyes for reading and school work. Indeed such a degree of abnormality may make it easier for him to read without eye strain. The myopic, or nearsighted, eye needs to accommodate much less than the normal eye when there is reading or close work to be done. For this reason such a person can read for hours without even the normal fatigue. Outdoors on the playground, however, the situation is different. Unfortunately there is little that can be done to "accommodate" the eye for distant vision, because contraction of the ciliary muscle of the eye would make matters worse when a distant object is to be seen. It is possible by squinting to make a close object somewhat plainer. This is due to the fact that a small opening of the eyelids tends to make a sharper—but also darker—image, and also to

Strike two! When a nearsighted boy is at bat, the ball suddenly flashes by him and is gone.

the fact that tear fluid between the closely approximated lids tends to make a cylindrical concave lens, which tends to correct the defect. Observe persons who have uncorrected nearsightedness and it will be seen that they usually have closely approximated lids—small eyes—and that they tend to squint when looking at a distant object. Squinting causes "crow's feet" at the outer angle of the eyes, and vertical wrinkles in the forehead.

The bookworm decides he needs sunlight, so he buys a sun lamp to use in the house.

The effect of any visual defect is much less disastrous to an adult than to a child, unless the defect has been present in the adult since he was a child. The character of the child is still undetermined and may be severely warped. A nearsighted child cannot do well on the playground because he cannot see. When he is at bat the ball suddenly flashes before him and is gone; in the field he cannot see the ball until it is too close to do anything about it; at basketball the hoop is indistinct; at any sort of outdoor sport he is a dub for the best of reasons. He will not like to hunt because he cannot see the game or the sights of his gun; he will not like to tramp because distant objects are poorly seen and for that reason not appreciated; he will not like races, or aviation, or travel or sports of any sort. As a rule these persons do not like the theater or the motion pictures and are likely to have the idea that the latter especially is entertainment for children only or, as they might say, for morons. It is because they cannot see the pictures clearly.

But at school the situation is different. It is so easy to see and so wonderful to read. There are none of the diverting influences that draw the attention of the normal child or the motor-minded boy to the fields, the parks and the woods. The child who knows that he cannot excel over his fellows in games gets a big satisfaction out of the conquests of the mind that he can command. After all, he reasons, this is what is really important. Ball games, hunting and fishing are a waste of time. What does it matter if one can't do those things?

The chap who likes to get his fun and entertainment from books and magazines is fortunate in a way. Such games as are found in printed pages are rarely seen on the gridiron! Besides, it takes a whole day to go to a football game and come home again, while one may see a dozen games in print and go half or all the way around the world in that time.

Unfortunately, however, the arm chair sportsman does not get the air, the sunshine, the pulse quickening exercise, the contact with his fellows and the thing for which the game really exists. If the bookworm thinks he needs sunlight, he buys a sun lamp and conscientiously uses it in the bathroom. He raises the window at night to get the fresh air that he reasons he should have. He staidly walks to the office and thinks that is all there is to exercise.

He sees the fine details. Columbus discovered America on Friday, the 12th of October, in the morning, and these facts are mighty important to the "myop." The farsighted boy on the contrary may possibly know that Columbus discovered America; he is not sure whether it was in 1776 or 1066 but he is quite certain that this is a fine day in October and that the hickory nuts are ready to shake down. When his classmates make mistakes the bookworm jumps to his feet with his hand in the air. He pleases his teacher but he loses his friends. He gets the reputation of being a "know-it-all" and a grind and is popular only on the days before the final examination. He doesn't count in athletics or at parties; he's not one of the bunch.

Hours of reading do not stimulate an appetite; they do not bring the glow of health; they do not

It is impossible to imagine T. R. as anything but a lover of the great outdoors.

make strong muscles; they do not cause a healthy tan. These persons are often finicky about their eating—and about everything else for that matter. It is because they see details so plainly, and scarcely see the larger things at all. Often they are intolerant of other persons who are less scrupulous and painstaking or who frankly enjoy so childish a thing as a moving picture, a ball game or a horse race.

We are familiar with the fact that the scholar often becomes round shouldered and stooped. The child who reads continuously is in some danger of postural defects. This is not so much due to the habitual position as it is due to the fact that such a child does not have strong muscles and bones. An active, vigorous girl may sit on her foot with impunity, but not so a weakly, studious type. Curvature of the spine is easily superimposed on such a basis; or rather we should say that it is hard to prevent curvature of the spine in such a set of circumstances. These persons for obvious reasons are more subject to tuberculosis than are their red blooded brethren.

Such a child as we have described is not dependent on others for entertainment and is liable to grow rather contemptuous of the abilities of others. He does not adapt himself to the surroundings and is not willing to make compromises. He is often severe in his righteousness and his rightness, and may become a disagreeable personage.

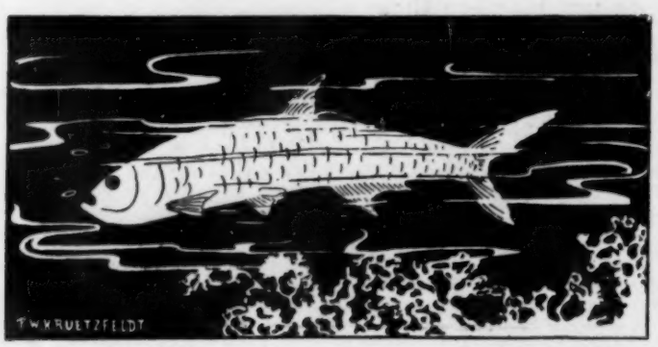
The bookworm has many highly desirable points and it is certain that he and his like have made a tremendous contribution to the intellectual life of the race, but we wish that they might be somewhat more likable and adaptable. It is such an easy matter to correct the defect that it seems a dreadful shame that children should be allowed to develop in an unnatural manner. Parents may try earnestly to get their children to enjoy some of the broader interests, but they are likely doomed to failure if the eyes are at fault.

Interesting in the present connection is the fact that Theodore Roosevelt was very nearsighted as a child. When he was given glasses he was "de-e-lighted" and ran about looking at everything with the greatest interest. He had not realized the beauty of the wonders about him and was wild with the joy of it. How different he would have been if he had not been given those wonderful glasses! It is impossible to imagine T. R. as anything but a lover of the great outdoors. If he hadn't been that sort of a chap he wouldn't have been the Teddy that we loved and admired, and it's likely he wouldn't have gone far.

Astigmatism is often not so easily corrected as nearsightedness but rarely causes trouble to the experienced oculist. It can cause much the same effects on character as nearsightedness, with which it is often associated. Astigmatism may not greatly complicate the reading of print, but it makes distant vision indistinct. If the two eyes are different in their defect, the effect is particularly bad and in such case may incapacitate the child at school as well as outside. Astigmatism is due to irregular curvature of the lens of the eye. The result of this is that while one part of the picture is in focus the other is entirely out of focus. For example, such a person may be able to see the horizontal stripes in a plaid suit and not the vertical. In such case the suit may look as if it had stripes running around the arms, legs and body.

If one will watch children or adults who have not done well he will notice that many of them do queer tricks with their eyes, or hold the head to one side or have numerous mannerisms. Old people must have reading glasses and so get into the habit of looking over their glasses or of losing them on their own foreheads. Every actor who attempts to imitate old age fumbles for his glasses when he attempts to read, trombones the newspaper and looks over his glasses. Occasionally one will see a child with premature wrinkles in the forehead, holding his head to one side and attempting to understand what is going on about him.

How unfortunate it is that such children do not receive intelligent appreciation of their defect! Often proper glasses would entirely correct it and allow a normal development.



SIMPLE LESSONS *in* *Human Anatomy*

Fig. 158.—Nerve trunks and some of their branches in the upper part of the body. (From a chart by Rebman.)

By B. C. H. Harvey

LESSON XIV, CONT.

THE NERVOUS SYSTEM

ALL the information the central nervous system receives from the outside world or from parts of our bodies is thus simply the effect of stimulation of the terminals of our sensory nerves. These nerves extend from the surface of the body and from nearly all its parts to the brain and cord. Though the nerve trunks are only eighty in number, nine pairs going to the brain and thirty-one pairs to the spinal cord, their branches are innumerable (fig. 158).

All but one pair of these nerves, the olfactory, have grown out in embryonic life from the neural crest. When the neural trough becomes folded in to form a tube (fig. 151, June number), it remains connected for a short time with the ectoderm, or skin, in the dorsal midline. When it is separated there remains along the dorsal surface of the tube a ridge where the attachment was broken off. This is the neural crest. Since there was a double connection with the skin, there is a double crest—a right one and a left one (fig. 151, anterior and posterior ends). The cells composing them become masses of nerve cells and their processes make the sensory nerves. Some processes grow toward the neural tube, and some grow away from it.

Just as a growing vine may send roots into the ground and branches spreading up over a trellis or a wall, so these growing cells in the neural crest send off roots into the neural tube and branches which spread through the body. Their terminal twigs, or tendrils, are sensitive to stimuli of specific kinds. Those near the surface get information of the outside world, and those that grow into relation with organs in the interior of the body, muscles and viscera get information of the state of those organs.

Thus each sensory nerve has roots in the dorsal part of the brain or cord and has on it a group of nerve cells—a ganglion—derived from the neural crest and lying close to the dorsal surface of the neural tube. These ganglion cells are the life centers of the sensory neurons. They preside over the nutrition of the neurons. The processes carry nerve impulses. From sensory end-organs they go into the cord, extend up and down in it (fig. 159) and become connected with other neurons transmitting information. The masses of nerve cells

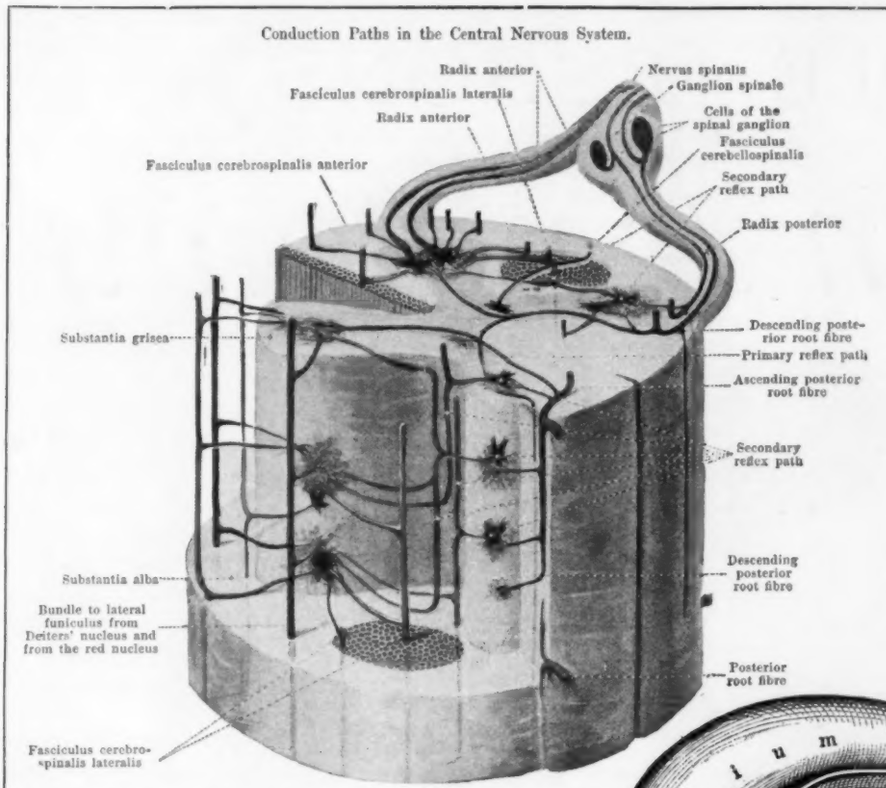


Fig. 159.—Part of the spinal cord showing gray matter (nerve cells) surrounded by white matter (nerve fibers). The anterior and posterior horns of gray matter are indicated. A few cells and fibers are drawn in to show some of the connections. (From Spalteholz' Atlas of Anat., Herzil.)

Fig. 161.—Section of the brain of an embryo, one month old. At this age it is a thin walled tube. Dotted lines separate the five parts. The shaded anterior portion is motor; the non-shaded portion is sensory. (From Herrick's Neurology, W. B. Saunders Co.)

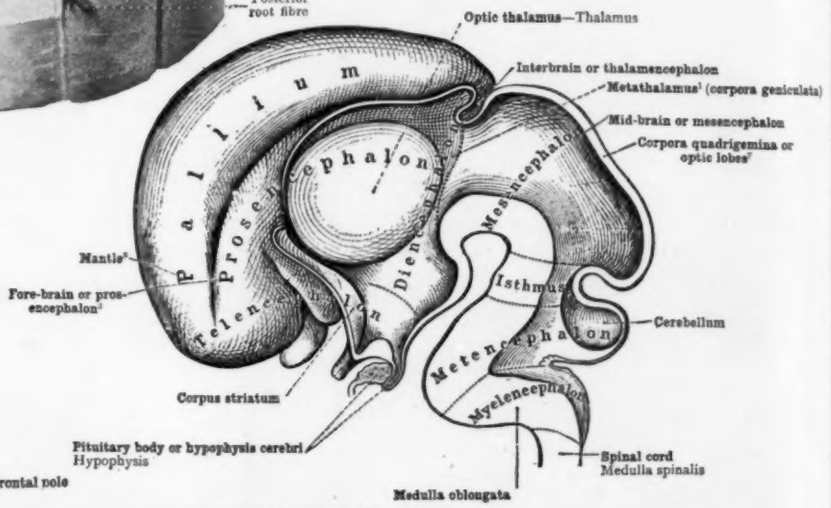


Fig. 162.—Section of the brain of an embryo, three months old. The end brain (telencephalon and pallium) has already grown over the interbrain and mid-brain. (From Toldt's Anatomy, Vol. II, The Macmillan Company.)

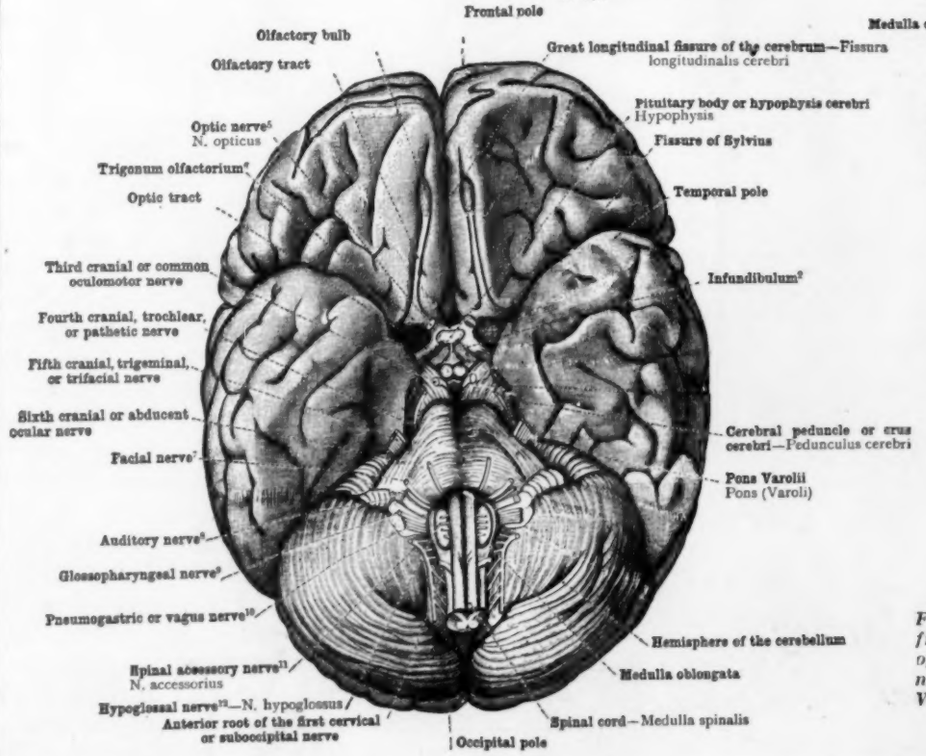


Fig. 160.—Base of the brain seen from below, showing the roots of the twelve pairs of cranial nerves. (From Toldt's Anatomy, Vol. II, The Macmillan Company.)

in the dorsal part of the cord and brain into which all sensory nerves discharge their impulses constitute the intelligence department of the central nervous system.

Of the forty pairs of nerve trunks, twelve pairs come from the brain (fig. 160); namely,

1. Olfactory.
2. Optic.
3. Oculomotor.
4. Trochlear.
5. Trigeminal.
6. Abducent.
7. Facial.
8. Auditory.
9. Glossopharyngeal.
10. Vagus.
11. Accessory (to vagus).
12. Hypoglossal.

Numbers 1, 2 and 8 are wholly sensory; nos. 11 and 12 are wholly efferent, or outgoing. The others have some fibers of each kind.

Thirty-one pairs of nerves grow off from the spinal cord; namely, eight cervical, twelve thoracic, seven lumbar, five sacral, and one coccygeal. Each has two roots, a dorsal and a ventral (fig. 152). Charles Bell, a Scotch surgeon, discovered in 1811 that the dorsal root is sensory and the ventral root is motor. The dorsal root has on it the ganglion derived from the neural crest. The two roots grow off from the cord separately and later become united to form a nerve with both sensory and motor fibers; that is, a "mixed" nerve. From figure 160 it will be seen that the nerves from the brain have usually only one root each, though this root may contain several bundles of fibers.

In following the ten cranial nerves that have sensory (incoming) fibers into the brain it will be convenient to state to what part of it each goes. The brain has five general parts called from before backward:

End-brain, including cerebral cortex	forebrain
Intermediate brain, including thalamus	forebrain
Midbrain, including colliculi (optic and auditory)	
Hindbrain, including cerebellum	
After-brain, including medulla oblongata	

Of these the end-brain becomes much the largest. Its dorsal part becomes enormous in man (cerebral hemispheres). It grows upward and backward, so far that it covers over the intermediate and midbrains (fig. 162).

The first, or olfactory, nerves are peculiar. The ectoderm from which they grow is so far forward in the embryo as to be anterior to the neural tube. Thus these nerve cells never participate in the sinking in of the neural tube: they remain in the skin in that part of it which dips into the nasal fossa (fig. 128). The olfactory cells are true nerve cells, even though they are in the skin. They are the only nerve cells that remain on the body surface. They are surrounded by modified skin cells called supporting cells (fig. 163). Each has a tiny process terminating in a vesicle with little cilia on it. These vesicles and their cilia lie on the moist surface of the nasal fossa and are sensitive chemically to many substances which reach them through the air. They are the receptors of the sense of smell. One process, a true nerve fiber, though nonmyelinated, extends upward from each cell through the roof of the nose to the olfactory bulb (fig. 160). These bulbs lie one on each side inside the skull, just below the brain and just above the nasal fossa. In the bulb twenty or more fibers converge on one intermediate nerve cell and produce a unified effect. This summation of effect makes it possible for the olfactory terminals to detect substances in minute quantities. Alcohol is so detected in a solution only $\frac{1}{24,000}$ as strong as that necessary for recognition by taste.

From the bulb a tract of fibers leads to the forebrain. The olfactory sense is better developed in many lower animals than in man. In the human fetus the olfactory bulb has an extensive connection with the brain. The fact that this connection is relatively much greater than in the adult suggests that our remote ancestors had a much better sense of smell than our own. Ours start better than they finish.

The sensory terminals of the second, or optic, nerves are within the eyeball (fig. 164) in its innermost layer called the retina. The latter is an outgrowth from the forebrain and remains connected with the dorsal surface of it by the optic nerves and optic tracts. Later it becomes connected with the midbrain also.

The eyeballs are practically two cameras which grow around the retina, the latter being like a sensitive photographic plate. The cameras are adjusted and pointed by muscles outside them which rotate them. The pupil is an aperture in a diaphragm that regulates the amount of light. It is made larger or smaller by muscles inside the eyeball. The latter act also on the lens and by changing its shape they alter its focus. It is an advantage to have two eyes, for of course one may be injured, but further the amount of effort needed to direct and focus both at once on the same object helps us to estimate distance. We sense the effort without being conscious of it.

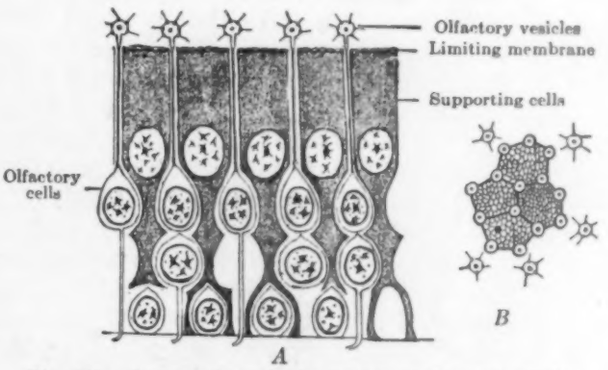


Fig. 163.—Section through the lining of the roof of the nasal fossa. On the right is a surface view showing the round openings through which the slender processes of the olfactory cells project. (From Herrick, Saunders.)

The retina contains many nerve cells and fibers. Those on its inner surface nearer the center of the eyeball are transparent, and the light from the lens goes through them to reach

the outer layer of cells. These are called rods and cones on account of their shape. Their short processes are the nerve terminals which are sensitive to the ether vibrations of light (fig. 165). There are about 130 million rods and 7 million cones. We can distinguish about 200 different color tints. The rods contain a reddish chemical substance which bleaches with light. This permits photographing on the retina itself. Figure 166 shows such a photograph. The eye of a dead animal had been kept in the dark and then exposed to light from a window. It shows a picture of the window.

From the retina nerve fibers pass to three nerve cell masses in the dorsal parts of the intermediate brain and midbrain. Relays of fibers go on from one of these to the eye muscles to focus the eyes, from another down the cord and eventually by another relay to body muscles to effect appropriate movements, and from another to the cortex at the posterior pole of the brain to give us conscious pictures. It is estimated that in the production of a picture in consciousness of a seen object at least 100,000,000 different neurons are activated.

The eighth, or auditory, nerve leads from terminals located in the inner ear to the dorsal part of the hindbrain. These terminals, though deeply situated for protection, are exposed to the air vibrations which produce sound. An admirable conducting mechanism in the ear leads the vibrations to the interior (fig. 167). The nerve terminals are fine hairs projecting upward toward the tectorial, or covering, membrane (fig. 168). This membrane is believed to vibrate in different parts in consonance with sounds of different pitch and thus to stimulate different hair cells (there are more than 15,000 of them in each ear), thus enabling us to distinguish different tones. The nerve cells of the auditory neurons are derived from the neural crest. Their cell bodies form a group, or ganglion, which lies in the axis of the cochlea.

The cochlea is shaped like a snail shell (fig. 169). A canal runs spirally round its axis making two and a half turns. This canal is full of fluid and contains the auditory nerve terminals. Thus the vibrations that our nerves detect are vibrations in fluid, not in air. The air vibrations produce the vibrations in the fluid. The organ of hearing is exquisitely delicate and for its protection the whole cochlea is overgrown and surrounded by bony substance and lies deep in the interior of the temporal bone of the head.

In the eighth nerve are also other fibers which are not auditory at all. They serve other senses of enormous importance but seldom appreciated. Some of them come from three delicate membranous semicircular canals (fig. 169) which lie in the interior of the temporal bone. This apparatus gives us our sense of movement in space. It is well developed in all vertebrates. Fishes swimming in the dark have much need of it. The canals are in three planes—one horizontal, and two vertical at right angles to each other. They are filled with fluid and each contains at one end, which is somewhat enlarged, a cupula, a little gelatin-like mass lying in the fluid. The nerve terminals are little hairlike processes that project into the cupula. In movements of the head the cupula tends to pull on some of the hairs, stimulating them and giving us our sense of direction of movement.

Other fibers in the eighth nerve come from a delicate membranous sac, the utricle or utriculus (fig. 169), which is close to the semicircular canals. It also is full of fluid and contains some fine stony particles called ear stones, or otoliths. This gives us our sense of position when the head and the rest of the body are still. The otoliths always tend to sink to the lowest level in the fluid. Delicate hairlike nerve terminals are on the walls of the sac, and so in different positions the otoliths touch and stimulate different terminals and thus give us our sense of different positions.

In an effort to learn something of the manner of working of this important sense an interesting experiment was made by Kreidl. He was able to substitute little particles of iron for the otoliths in a shrimp. Afterward when a magnet was brought near, the shrimp lost its sense of position.

Many persons are not aware that they possess these senses of position and movement because there is nothing on the surface of the body, like eyes or ears, to indicate their mechanism. The nerves to these sense organs are incorporated for some distance with the auditory nerve. The ganglions on them are enclosed in the temporal bone and they carry their sensory impulses along with the auditory into the dorsal part of the hindbrain, or cerebellum.

Another sense closely associated with these is that of skeletal muscles. We sense unconsciously the effort being made by muscles. Nerves to muscles composed of striped fibers have in general 40 per cent of sensory fibers in them and we are able to modify and coordinate our muscle actions with amazing delicacy. A baseball pitcher can put the ball now over one corner of the plate, now over the other. He could not make the slight change with certainty unless he sensed what the muscles had been doing. Even standing requires constant adjustment of muscle action in response to sensations of pressure or position. The nerve terminals are in the muscle spindles.

Some tiny muscle fibers are grouped in spindle-shaped masses among the larger fibers (fig. 170). These have the sensory nerve terminals. When the big fibers around them contract, the little ones contract also. Their contribution to the muscle pull is not great, but they do another thing. The little fibers tell on the big ones. They report what they are doing. All

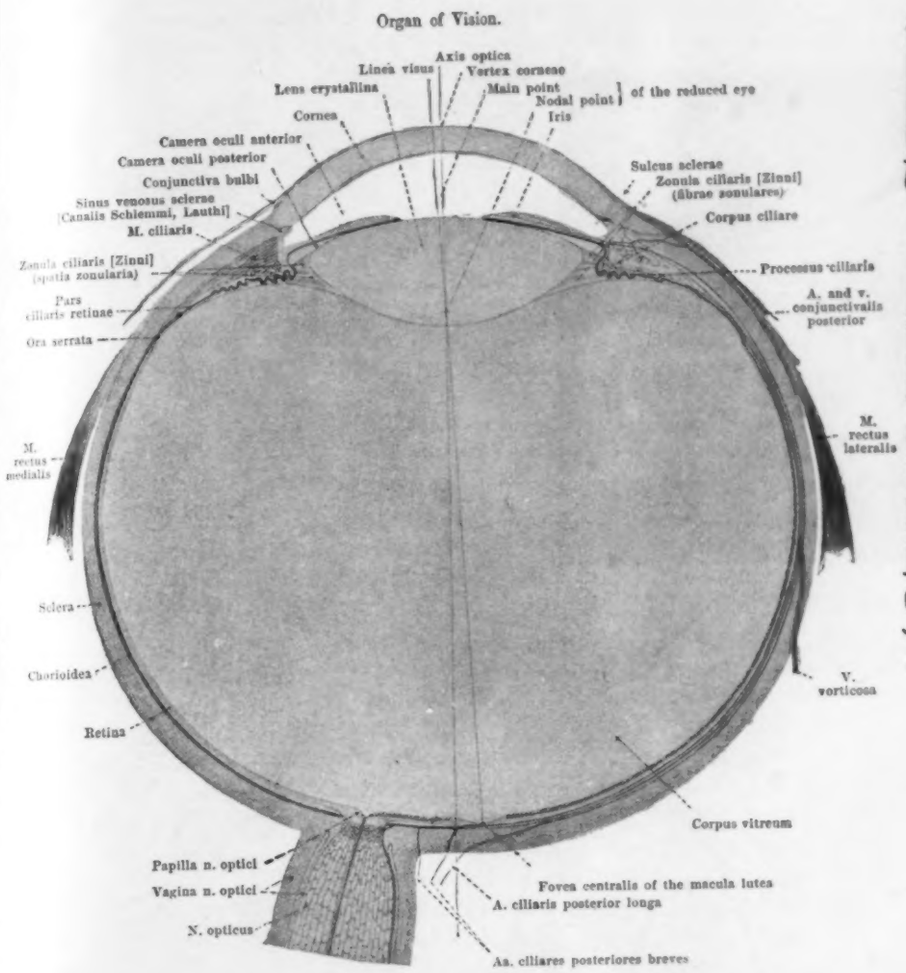


Fig. 164.—Horizontal section through the right eye, seen from above. This is a diagrammatic representation. (From Spalteholz' Atlas of Anatomy, Herzil.)

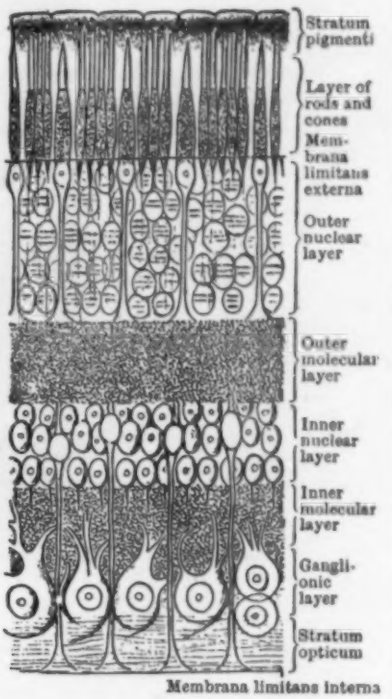


Fig. 165.—Diagram of a section through the retina. The layer of rods and cones is the one sensitive to light. (From Cunninham's Anatomy, William Wood & Co.)

Fig. 166.—Photograph of a window appearing on the retina of a dead rabbit. It had been kept in the dark and then exposed to light from the window. (From Howell's Physiology, Saunders.)

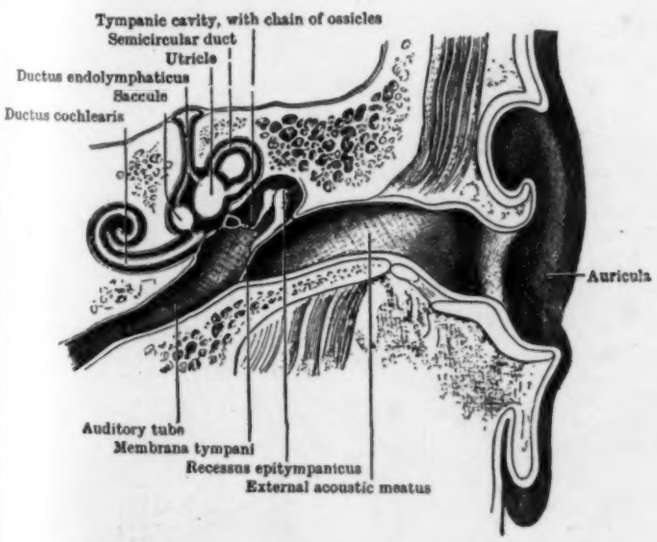


Fig. 167.—Diagrammatic view of parts of the ear. (From Cunningham's Anatomy, William Wood and Company.)

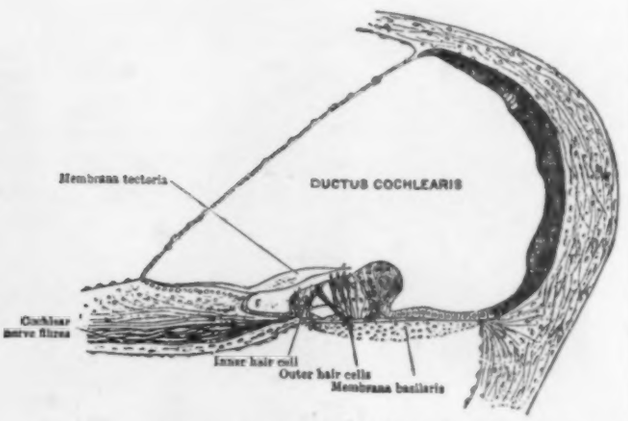


Fig. 168.—Diagram of a section through part of the cochlea, showing part of the mechanism of hearing. The tectorial membrane vibrates and stimulates the hairlike processes of the hair cells. (From Herrick's Neurology, Saunders.)

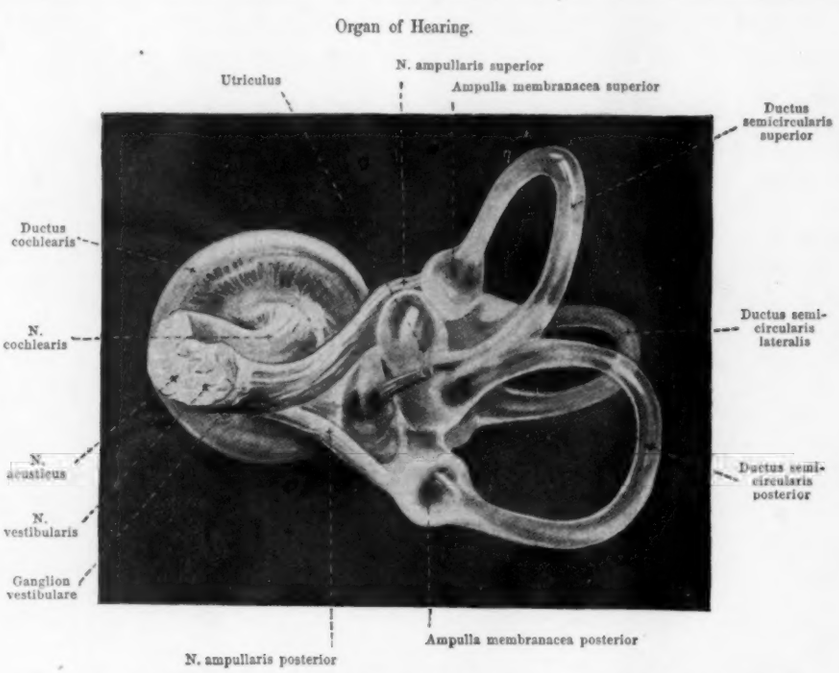


Fig. 169.—Semicircular canals, utriculus, base of the cochlea and some of their nerves. From a human adult; magnified 5 times. (From Spalteholz' Anatomy, Herzil.)

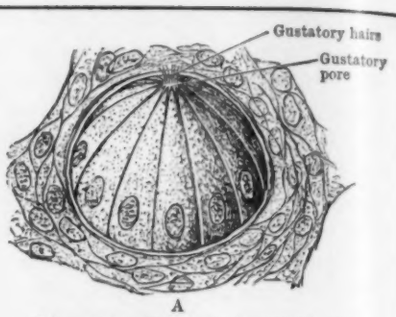


Fig. 171.—Taste bud partly exposed. The taste cells are inside and their hairlike sensitive processes project through the pore at the top. (From Cunningham's Anatomy, William Wood & Co.)

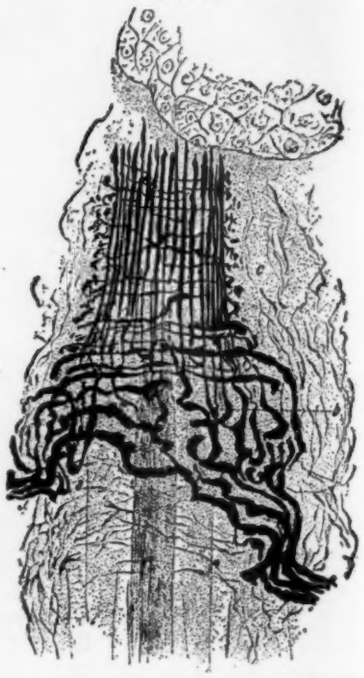
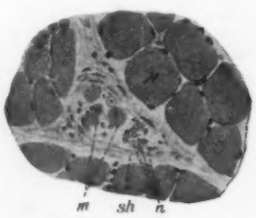


Fig. 173.—Nerve endings round the root of a hair. (From Herrick after Bonnet, Saunders.)



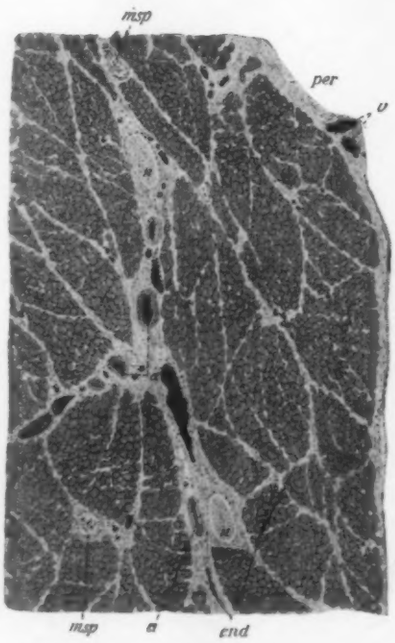


Fig. 170.—Section across a muscle spindle; n, sensory nerves; m, small muscle fibers; sh, connective tissue sheath; M, ordinary striped muscle fibers. (From Shäfer after Sobotta, Longmans, Green & Co.)

Fig. 172.—Nerve endings in a touch corpuscle occupying one of the papillae under the epidermis. Only the outline of the corpuscle is shown. (From Herrick's Neurology, Saunders.)

Fig. 174.—Saucer-like nerve endings under epithelial cells of a pig. Somewhat similar ones are in the lining of the human mouth and pharynx. (From Herrick, Saunders.)

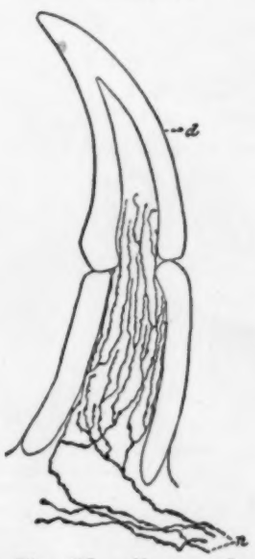


Fig. 175.—Nerve endings in a tooth. They produce only one sensation — pain. (From Herrick, Saunders.)

the dorsal roots of spinal nerves carry in muscle sense, as do also many of the cranial nerves; namely, 3, 4, 5, 6, 7, 9 and 10. The nerves go into the dorsal part of the cord and brain and the impulses are relayed by other fibers to the cerebellum along with the sensations of position and movement. It is clear that all these three senses must be combined if our muscles are to act fittingly. So all information of these kinds is transmitted to a great center, the cerebellum, which is the great correlator of muscular activity and movement in space. But the cerebellum has no consciousness whatever, and so the senses reporting especially to it—the muscle sense, the position sense and the direction of movement sense, whose mechanisms are so deeply hidden—carry in to the intelligence department their indispensable information, usually without any recognition.

Sensations of taste are carried in by the seventh nerve from the anterior part of the tongue, by the ninth from its posterior part and by the tenth from the epiglottis. The cells directly affected are not nerve cells, but specialized cells of the lining of the foregut, or entoderm. They form small masses called taste buds found on the tongue and pharynx. They are numerous on the walled papillae of the tongue (figs. 76 and 78, October, 1929, number). They form dome-shaped masses with supporting cells outside like the staves of a cask (fig. 171) and the taste cells inside, with their terminal hairs projecting through a pore at the apex. These hairs are chemically stimulated by substances in solution. They can distinguish only four chemical characters of these substances, and we call them sweet, sour, salt and bitter. As chemical analyzers they are not very efficient.

The sensory nerves so far considered carry impulses from terminals which are very highly specialized. Each is exquisitely sensitive to stimulation of a particular kind and not responsive to other stimuli. No amount of light stimulates a taste bud. The other sensory nerves both cerebral and spinal serve still other senses. Most of them lead in from terminals that are stimulated by touch—a very general term—and the resultant sensations are of many kinds, some conscious and some unconscious. Many varieties of these terminals are connected with one nerve.

Figure 137 in the May number shows two terminals common in the skin. The ones in the papillae are called touch corpuscles. The way in which nerve fibers terminate in them is shown in figure 172. They probably pick up delicate tactile sensations. The larger, deep corpuscles (corpuscula lamellosa) are believed to respond to pressure and to measure it. Figure 173 shows nerve ends round the roots of a hair. Hairs and the skin around them are especially sensitive to touch. Figure 174 shows nerve terminals common in epithelium like that lining the mouth or in the epidermis. Some bulblike terminals are believed to be especially sensitive to cold. Figure 175 shows the nerve ends in a tooth; these feel only pain. Tendons of muscles have on their surfaces nerve terminals like those shown in figure 176. These are stimulated by the stretching of the tendon during the contraction of muscles. There are many other terminals concerned in sensation. Many are in the viscera; we are not conscious of these in health, but they have a necessary part in the regulation of visceral activity. Special nerve stimuli accompany hunger, thirst, nausea and obscure abdominal sensations accompanying emotions like the "yearning of the bowels" of which the Bible speaks. The receptors and other mechanisms of many sensations are still imperfectly known but it is obvious that we have many more than the proverbial five senses.

Through all these channels sensations stream into the dorsal part of the central nervous system. Many of them go directly to the brain and those that go to the cord connect there with neurons (fig. 159) which relay the impulses up to the head. In the head they are combined; the brain knows all that any part learns about the environment or about the body. It receives millions of impulses from eyes, thousands from ears, innumerable ones from smells. Touch and pain, heat, cold and pressure are reported to it, the position of joints, all changes of position and all the quiverings of skeletal muscles. The reception and combination of all these impulses are the work of the intelligence department; it requires an extensive mechanism. That is part of the reason why the dorsal part of the brain becomes so large—much larger than the ventral part in which the motor or executive department is situated.

Fig. 176.—Nerve endings on a tendon near its junction with a muscle. (From Herrick, Saunders.)

Chicago Tuberculosis Institute

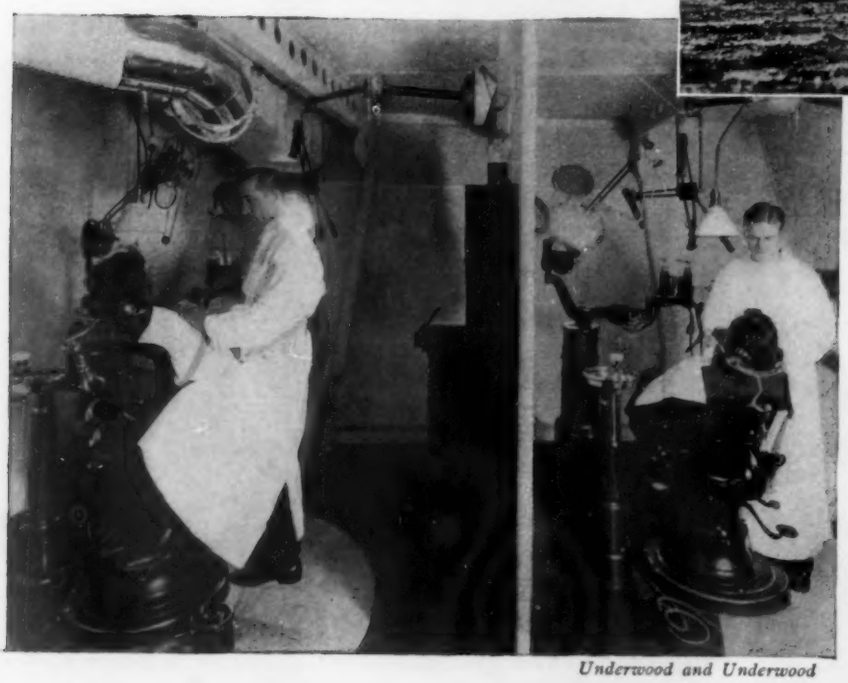
HEALTH CENTER FOR MEXICANS

These Mexican doctors and nurses are on the staff of a new health center opened by the Chicago Tuberculosis Institute to improve health conditions among the Mexican population of the city. Change of climate, lack of acquired immunity and unhygienic modes of living make them an easy prey to disease.

Underwood and Underwood

INTRODUCING "LIGHTNING"

"Lightning" is a fast new game invented by George B. Emerson, director of physical education at Boston University. It is said to combine characteristics of football, baseball and hockey. A team has seven men: a "wandering goalie," two half-backs, a quarter-back, a rover and two full-backs.



Underwood and Underwood

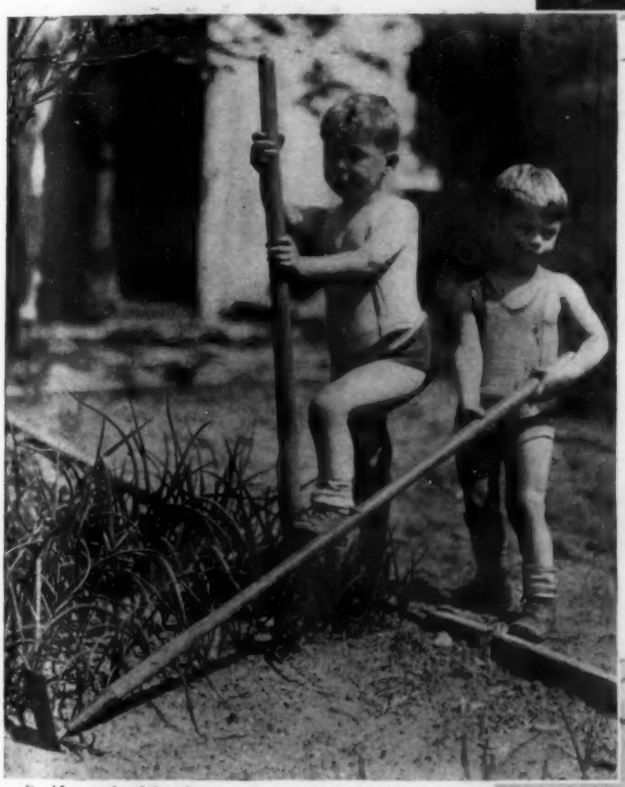
DENTISTS AT SEA

Navy aviators stricken with toothache have access to modern dental treatment in these dental offices on board the U. S. S. Lexington, giant aircraft carrier.

ANNIHILATING ANOPHELES

Early in the spring this crew was at work spraying the marshes near La Grange, Ill., to prevent the breeding of the anopheles mosquito, which carries the germ of malaria.

Pacific and Atlantic



Pacific and Atlantic

THEY KNOW THEIR ONIONS

Cultivating onions is only a side line with these California youngsters. Their main business is to absorb ultraviolet rays from the sunshine, a process aided by their sun suits.

DUTCH NURSES HONOR "LADY WITH A LAMP"

In tribute to Florence Nightingale, this group of Dutch and British nurses placed a wreath on her grave at East Wellow, England.

Underwood and Underwood

Pacific and Atlantic

SOVIET CHILDREN

The most modern nursery fixtures are provided for children at the first house of the Commune in Moscow, Russia. Each child has his own towel and place to keep it, marked by a distinctive emblem.

IN VIENNA

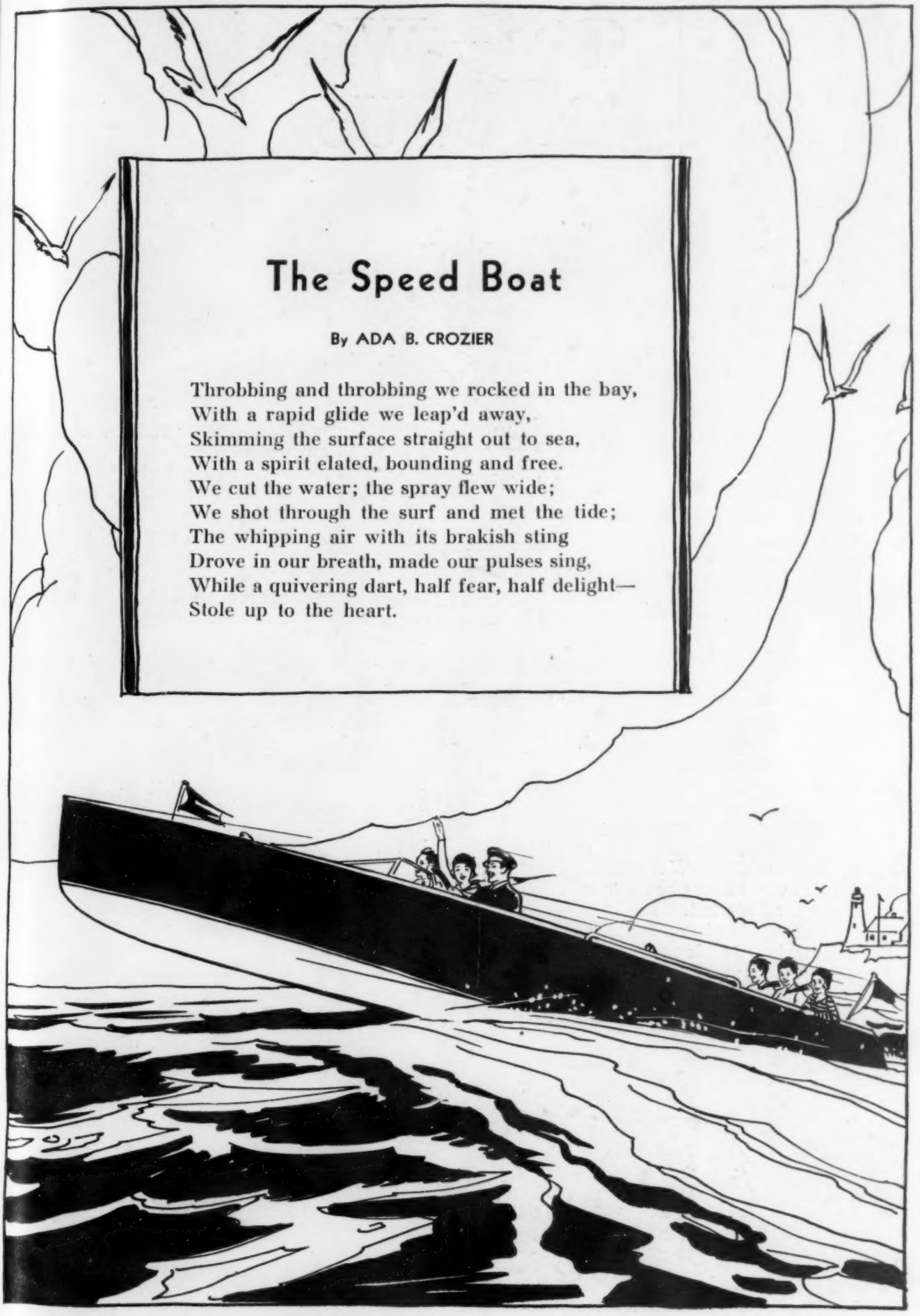
The city of Vienna has opened a hotel for young students and visitors who cannot afford regular hotel rates. This is a view of the dining room.

Underwood and Underwood

Underwood and Underwood

WORLD'S TALLEST SOLDIER IS IN POLISH ARMY

Leon Grabowski of Upper Silesia, 7 feet, 2½ inches tall, completely dwarfs a man of average size. He is said to be the tallest soldier in the world.



The Speed Boat

By ADA B. CROZIER

Throbbing and throbbing we rocked in the bay,
With a rapid glide we leap'd away,
Skimming the surface straight out to sea,
With a spirit elated, bounding and free.
We cut the water; the spray flew wide;
We shot through the surf and met the tide;
The whipping air with its brakish sting
Drove in our breath, made our pulses sing,
While a quivering dart, half fear, half delight—
Stole up to the heart.

Piggy-Wee Grows Up

By J. Mace Andress and Annie Turner Andress

ONCE there was a big mother pig.

She had many, many children.

There were Piggy-Wig and Piggy-Wee, Piggy-Dig and Piggy-Dee.

There were six others but I do not know their names.

Piggy-Wee was tiny.

He had nine brothers and sisters, but he was the smallest of all.

Piggy-Wee was a fussy pig. He would not eat vegetables. He did not grow fast.

Piggy-Wee was a naughty pig. Sometimes he ran away.

Once when he ran away, a big dog ran after him.

The big dog barked and barked.

Piggy-Wee was frightened.

He knew that there was a little hole under the gate. How he ran for that hole!

Piggy-Wee was just squeezing into the hole when the big dog came up. He growled. He barked. He bit Piggy-Wee's tail. Piggy-Wee squealed and when he looked around all the curl was gone out of his tail.

Piggy-Wee squealed and squealed!

He ran straight to his mother.

Mother Pig said: "The place for little pigs is at home. Do not go so far away from home again. You might lose your tail the next time the big dog runs after you."

After this Piggy-Wee stayed at home with his mother and his brothers and sisters for a long time.

Then one day he said: "I am tired of staying at home. I will go away to see the world. I may grow into a big pig."

It was early in the morning. The sun was just coming up.

Mother Pig, Piggy-Wig, Piggy-Dig, Piggy-Dee and all his brothers and sisters were sound asleep.

Piggy-Wee put his nose out from under the straw and looked around. Then he grunted "Good-by."

It was not a loud grunt.

Piggy-Wee had tears in his eyes.

He ran as fast as he could to the gate.

Then he put his head through the hole and looked.

He could not see the big dog.

Piggy-Wee listened.

He could not hear the big dog.

Then he squeezed through the hole to the other side of the gate.

"When I get to be a big pig, I shall not be afraid of the dog," he said.

The big dog growled and barked. He bit Piggy-Wee's tail.

Soon Piggy-Wee came to a strange house. It was Roly-Poly castle.

Piggy-Wee ran down the road. Oh, how fast he ran! But the big dog did not chase him.

The sun was hot.

The day was long.

Piggy-Wee was tired and hungry.

He wished he might go home. But he could not turn back. He was afraid of the big dog.

Soon he came to a great wood.

"Who comes here?" cried a little voice.

It was a little green elf.

"Why, it is only Piggy-Wee," he said.

"What are you doing?" asked the little green elf.

"I do not know," cried poor Piggy-Wee, "but I want to see the world."

"What do you expect to find out?"

"I want to find out how to grow big and strong. Then I can frighten the big dog. He bit my tail and I squealed and now all the curl is out of my tail."

"Oh," said the little green elf, "I think your tail will soon be well again. Take that path through the wood. You will come to the castle of King and Queen Roly-Poly. They are very wise pigs. They will tell you how to grow big and strong."

Piggy-Wee was tiny and the wood was dark. He was much afraid. How he did scamper to find the Roly-Poly castle!

Soon he came to a strange house. The walls were made of beets. The roof was made of spinach leaves. The fence around the house was made of carrots.

Piggy-Wee knocked at the door. It was opened by another little green elf.

"May I see King Roly-Poly?" he squeaked softly.

"The king is not at home," said the elf. "He has gone hunting."

"Then may I see Queen Roly-Poly?" asked Piggy-Wee gently.

"What is your name?" asked the elf.

"It is just Piggy-Wee."

"Wait a minute," said the elf. "I must see the queen."

Soon the green elf came back.

"The queen will see you," said the elf.

How lovely Queen Roly-Poly was! She wore a crown made of daisies. She was dressed in white. How plump and clean she looked!

The queen was eating dinner with all the little Roly-Polies.

"You must be tired," said the queen. "Sit in this little chair and have some dinner."

Piggy-Wee was tired and hungry. It made him happy to think of something good to eat. But when he looked at the table he saw only vegetables to eat. There were peas, carrots, new potatoes, spinach, beets and onions, all the things Piggy-Wee did not like.

Piggy-Wee began to cry.

"Oh, dear! What is the matter?" asked Queen Roly-Poly.

"I do not like vegetables," cried Piggy-Wee.

He cried, and the big tears ran down to the end of his nose.

"You cannot grow up and be a big pig unless you eat vegetables," said Queen Roly-Poly. "You need vegetables to make your tail curly, too."

"Please, may I have something else to eat?" asked Piggy-Wee.

"No, not until you eat some vegetables," said Queen Roly-Poly.

"I do not like vegetables," cried Piggy-Wee.

Now Piggy-Wee was hungry, very hungry, and he did so want to be a big pig. He also wanted his tail to be curly again. So he did just as Queen Roly-Poly told him. First he tasted just a bit of buttered beets and then the tiniest bit of spinach. They tasted good.

"I like them," he said.

Then Piggy-Wee soon learned to like all vegetables.

He ate lettuce and even onions. He also drank milk. He ate lettuce and clover, and played outdoors in the sunshine with the little Roly-Polies.

How Piggy-Wee grew!

Every month Queen Roly-Poly weighed him. He always gained in weight.

Then one day he was a big, big pig. His tail had grown long and it had begun to curl again.

Piggy-Wee wanted to go home to his mother and his brothers and sisters.

"Good-by, dear Piggy-Wee," said King and Queen Roly-Poly and their children.

"Good-by," said the little green elves.

Piggy-Wee was happy. It was good to be a big pig and have a curly tail. He was glad to be going home. Off he trotted.

He ran fast. Then he came to the gate. But the hole in the gate was now small, and he was big. He could not get through.

"Bow, wow, wow!"

It was the big dog.

Piggy-Wee was not afraid. He grunted. He opened his mouth and ran after the big dog.

This time the dog was afraid. Away he ran.

What was Piggy-Wee to do? He waited and waited. How could he get through the gate?

At last a farmer came along. He opened the gate. Piggy-Wee ran between the farmer's legs. Down fell the farmer. Away ran Piggy-Wee.

How happy he was to get home!

Mother Pig was glad to see him. "What a big pig you are," she said. "How you have grown!"

Then there were Piggy-Wig, Piggy-Dig, Piggy-Dee and the six others. They were grown up now and were big pigs. But they were no bigger than Piggy-Wee.

"Where have you been?" asked Mother Pig.

"I have been to see the world," said Piggy-Wee.

"What did you learn?"

"I learned to eat vegetables."

"Ugh, ugh," grunted Piggy-Dig.

"Ugh, ugh," grunted Piggy-Wig.

"Ugh, ugh," grunted Piggy-Dee.

"Ugh, ugh," grunted all the other brothers and sisters, "we learned to eat vegetables and we stayed at home."

Tiny Mary

A Children's Story by Ida Spaeth

TINY Mary had not always been tiny. Once she had been as large as any 6 year old girl should be. But now she had become so tiny that even her dollie's dresses were too large for her. She could not wear the nice lace hat her Aunt Mary had given her any more, or the lovely new slippers with the gilt buckles Uncle Jack had brought her. Her mother went to every shop, but she could not buy a thing small enough to fit Tiny Mary. Poor child, she scarcely had a thing to wear.

Of course Tiny Mary's becoming smaller and smaller worried her mother a great deal. One day she took her to the doctor to see if there was anything he could do to make her grow again. After he had examined Tiny Mary all over, he took off his glasses, stroked his long beard and said:

"I am afraid she will get smaller and smaller unless something is done at once, although she is really not sick now."

"Oh, doctor," said her mother anxiously, "what can we do to make her grow? Is there any medicine that would help?"

"No, no," said the doctor, "she doesn't need any medicine. The only thing that will make Tiny Mary grow is lots and lots of milk—at least, a glass full at every meal—some fresh green vegetables and fruit every day, and plenty of sleep. These will make Tiny Mary a big, beautiful girl again."

But naughty Tiny Mary would not drink milk; no, she would not! She would not eat any nice fresh vegetables; no, she would not! And she would not sleep long hours; no, indeed! Her mother coaxed and her daddy begged, but it was of no use, *she became smaller and smaller.*

Of course, she could not go to school any more because the seats were much too large, and her voice had grown so small that the teacher could not hear a word she said. She stayed at home all day and drank tea from her tiny little doll tea-cups, and decided she would always be Tiny Mary.

One day she crawled from her little doll chair and strolled to the garden. When she reached the cabbage patch she was so tired that she had to sit down to rest. She nestled under a nice green cabbage leaf and played that it was a green silk parasol.

Pretty soon along came a queer little creature just about her size carrying a great load on his

back. When he spied Tiny Mary he stopped and gazed at her a long time. "What ever can it be? What ever can it be?" said the queer little creature. "It isn't a grasshopper. No, it isn't a caterpillar. No, and it isn't a cabbage worm. It must be some new kind of worm," said he, as he crawled on down the road, leaving a silver trail behind him.

Just then a cabbage worm peeped his head over the side of the leaf. As soon as he spied Tiny Mary he wiggled and twisted and nodded and squirmed in a most excited way. "What ever can it be? What ever can it be?" said he excitedly. "It must be a new kind of worm; I'll have to examine it more closely," and with that he turned a somersault and landed right at her feet.

"Go away, you ugly thing. I'm not a worm; I'm a little girl," said Tiny Mary angrily.

"A little girl?" said the caterpillar, "Oh, no, you could never make me believe that. Never! Never! You're a new kind of worm, that's what you are." And he laughed and twisted and giggled until he nearly broke in two.

Pretty soon a grasshopper came jumping along the path. When he saw Tiny Mary he gave a great hop and landed right beside her. He looked and looked at Tiny Mary, first on this side and then on that. Finally, he said, "I never saw you before. What are you any way?"

"Why, I'm a little girl; that's what I am."

"A little what?" asked the grasshopper, so surprised he could not believe his own ears.

"I'm a little girl, I said."

"Well, you're the funniest looking girl I ever saw. To tell you the truth, I thought you were a worm," and with that the grasshopper hopped away disgustedly.

Poor Tiny Mary could stand no more. With tears in her eyes and a throb in her heart, she rushed to the house and to her mother's arms. "Oh mother, mother," she cried, "*I want to grow.*"

"So mother's tiny girl wants to be a big girl, again. Well, we can soon make you grow, dear."

Her mother hurried to the pantry and brought out a doll-cup of nice, creamy milk, a little piece of lettuce leaf, a tiny piece of brown bread, and three doll teaspoonfuls of soft boiled egg.

Tiny Mary ate every speck of it; yes, she did! Now this was the first good meal that she had eaten in such a long time, that what do you think happened? Why, she went to sleep right there at the table, and she did not wake up again till 7 o'clock the next morning.

The first thing in the morning when she had had her bath in the little doll tub and was dressed, she called for her breakfast. "Mother dear," she added, "bring me something that will make me grow." Her mother brought her a breakfast big enough for two dolls almost, and she ate every speck of it; yes, she did!

My, the meals that child did eat! And she never, never left a speck on her plate. Pretty soon she was eating as much as the cabbage worm, the land snail and the grasshopper put together could eat, and then what do you think happened? *Tiny Mary began to grow.*

She grew, and she grew, and she grew. Pretty soon she was as large as a 6 year old girl should be. She has gone back to school now, and no one thinks of calling her Tiny Mary any more.

WHITHER

Tell me where you will hie
On the Fourth of July.
To the sands, to the park,
To the rockets at dark?
Or parade with your chum,
Beating bravely the drum?

HEALTH *and the* SCHOOL

Edited by
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Selecting Textbooks on Health

THE choice of textbooks on health is one of the most important functions of the supervisor of health education. It is true that the teaching based on textbooks is only one phase of health education, but it is one of the major forces in the health education program. We might define health education in a general way as the sum total of all those influences brought to bear on school pupils to determine healthful living.

The health education program in a school or a system of schools is broad in its scope. It involves every individual in that school or school system who comes in contact with the pupils—teacher, school nurse, school physician, special teachers of health and the school janitor. Into this picture we must also fit the parent and the family physician. A comprehensive school health program must take into consideration the hygiene and sanitation of the school plant. It must concern itself with the habits and attitudes cultivated in the school. So far as possible the school should reflect the problems of the larger society of which it is a part. In its operation it should be a miniature society, which under expert guidance solves its personal and social health problems effectively. Health education should be a matter of social cooperation.

Textbook Is Needed

Some educators lay such emphasis on guiding the actual health activities of the child in the right way in school, on correlating health with various school subjects and on the incidental teaching of health that they minimize the influence of the textbook, even thinking it unnecessary. Such radicals, however, belong to the minority. Correlation is desirable but as the only method of teaching it ordinarily fails unless there is some watchful supervisor in charge who carefully plans the correlation and follows it up to see that the correlation is made. Incidental teaching of health is desirable and the school should always take advantage of every opportunity it may have to give instruction and training. But to build a program on incidental instruction and training will not insure on the part of the pupil a systematic and fairly complete body of knowledge. Since teachers, especially in the lower grades, have many subjects to teach and have a limited amount of time for research and the collection of material, a textbook seems as necessary in health as in other subjects.

Tests of a Good Book

The textbook plays an important part in the health program because it determines to a large extent the facts which the pupils will learn and the attitudes which they will acquire. Some of us recall the names and even the color of the book covers of textbooks that are vividly reminiscent of toil, tedium and disgust while other books lead us to relive our school days with satisfaction. The influence of the textbook is so great that it behooves educators to select it with care. During vacation days teachers often look over textbooks and decide on the ones that they will use for the coming year. As an aid in such a venture, the editor of this department would like to suggest that the following questions be kept in mind in choosing a textbook:

1. *Is it scientifically accurate?* This is the first hurdle to be negotiated. Any textbook that is unreliable from the point of view of scientific facts should not be put into the hands of pupils. We may have some sympathy with an old textbook, although a book on health unless it is frequently revised is soon behind the times, but certainly we should select a book that is free from scientific errors. A textbook for children, which has recently appeared, proclaims in bold type in a paragraph heading "Milk a Perfect Food." Yet any serious student of nutrition knows that this is not true. Dr. Samuel J. Crumbine and Dr. James A. Tobey, sensitive to scientific accuracy, have written a fascinating book on milk, which they have called "The Most Nearly Perfect Food." Certainly so much can be said about the value of milk in the diet that it is not necessary to exaggerate the merits of milk. The facts show that there is only one time in the life of the individual when milk can be thought of as a perfect food. That is during the period of infancy. Milk is seriously deficient in iron but at birth the child has a supply of iron stored in the liver that is sufficient for his needs for the first few months of his life. Experience shows that a better nutritive condition can be promoted by including early in the diet egg yolks, vegetable waters and, later, spinach and vegetable purées.

Although an attempt to feed a person indefinitely on milk alone would result in anemia and serious, if not fatal, illness, milk remains the one food that is most nearly perfect, and children should probably use about a quart a day to be in perfect health. Besides the deficiency in iron, milk also lacks cellulose, which nutritionists regard as necessary to promote digestion.

The Ventilation Problem

Several textbooks now on the market make wrong statements about ventilation. It is a scientific fact that oxygen is the vital part of the air which we need for life, but it is not true that the bad effects of a poorly ventilated room are due to a lack of oxygen and an excess of carbon dioxide. The air in the worst ventilated room has plenty of oxygen for human needs. The air in a badly ventilated room is above 68 F. and lacks motion.

Some of the errors found in textbooks are minor and due to carelessness while others are more serious.

2. *Does it tend to promote wholesome attitudes?* Any subject, if not properly taught, may arouse in the mind of the pupil a positive dislike. The study of hygiene in common with other subjects shares this danger, but in addition to this there is another danger that grows naturally out of the subject matter itself. Hygiene deals with topics that tend to arouse fear of sickness and death. If the study of hygiene lays too much emphasis on disease and mortality it may arouse loathing and disgust. One text has a discussion of mushrooms, and an illustration shows the graves of those who made a mistake in picking poisonous toadstools instead of edible mushrooms.

A textbook on hygiene should lay its emphasis on positive health. The subject matter and the illustrations should arouse in the pupil's mind ideas that are pleasant, attractive and inspiring. One of the outcomes of health teaching should be a wholesome attitude toward oneself and others. If this hurdle cannot be negotiated with success the book should not be used.

3. *Is it practical?* The general aims of health teaching are knowledge, habits and attitudes that will promote healthful living. Frequently textbooks contain information which the pupil cannot use immediately and may not use to any great extent later in life. For example, one book adapted for about a sixth grade contains a complete discussion of outhouses and sewage, things over which the child has practically no control. The point to be considered by the health educator is whether the book will help the child to live in a more healthful and wholesome way in his environment. Will it make for the formation of habits necessary for everyday living?

4. *Is it interesting?* Unless a book is interesting to the pupil, it will not tend to promote action and the right kind of attitudes. The knowledge gained will not be remembered. A book is interesting if it allows and stimulates the pupil to do those things that he naturally likes to do. Children love stories, adventure, experiments, puzzles, dramatization, construction work, plays, games and puzzles. A book that allows a child to express his interests is bound to be interesting. A live teacher by making use of many outside sources of information and devices and through the influence of a virile personality may get children interested even with the driest kind of book. The ordinary teacher needs a text that is interesting in itself.

5. *May it be studied without eyestrain?* All books should be printed in large enough type so they may be read with ease and comfort by pupils. Some curious things are found in our best textbooks. Here is one that has an admirable chapter on the eye but violates many of the principles advocated in page after page of illustrative material which the pupil is invited to read although the print is so fine that the writer found a reading glass necessary. Such glaring inconsistencies in a text are serious.

6. *Is it teachable?* This is one of the most important hurdles to be negotiated, for if a text is scientifically accurate and conforms in every other respect to the standards enumerated it will be worthless unless it lends itself with ease to actual situations in the schoolroom. If it is teachable it will be properly graded so that it may be used with success in the grades for which it is intended. The vocabulary, subject matter, exercises, illustrations, methods of approach, and aids for the teacher will be of such a character that teachers will find it satisfactory.

If the author is a successful teacher it is often assumed that the text will be teachable, but this is not always a safe assumption because a good teacher in the classroom, especially if he is writing for a different group of students, may prepare an inferior text.

Again, it is sometimes assumed that if the writer says in his preface that the book has been tried out in manuscript form in the classroom this fact insures its being teachable. This may or may not be true. Often the manuscript may be tried out with superior teachers and under special conditions and will not be teachable under ordinary conditions. Probably the best way to determine whether a book is teachable is to try it out with a small group first under conditions that are fairly typical.

TEACHING HEALTH

(In this column will be published each month concrete examples of good health teaching. Teachers are invited to send in contributions not exceeding 600 words and preferably less to the editor of this department. Illustrations of the actual work of children will be welcomed. Contributions accepted will be paid for but no manuscripts will be returned.)

PLAYING THE GAME OF HEALTH

Novel Experiment in Teaching Health Through Home Economics

DO YOU wonder who they are—the bright-faced girls and the little tots on the next page?

They are the Little Mothers with their Preschool Projects, whose part in the Game of Health as it is played in the high school in Pocomoke City, Md., constitutes an important feature of the whole delightful game.

The Little Mothers are a class in fourth year home economics. Ever since they entered high school they have been playing this game. Indeed, before they became high school students they participated in some of the activities, for both their secondary and elementary schools have been on the same campus.

Interested cooperation on the part of the elementary teachers has made it possible for the senior girls in home economics to do actual classroom teaching of health in the grades one or two periods a week. The girls work in pairs, or singly, according to the size of the group they are to teach and according to their own ability and to their wishes.

The girls make a tentative selection of lessons to be taught in the periods allotted them—ten or twelve. The lessons must be adapted to the age and ability of the group; likewise must their own ability be considered. All possible encouragement is given to originality and ingenuity in teaching plans which the girls must devise.

For all their inexperience, many fine ideas have been contributed by these teachers in embryo. Their youthful enthusiasm in putting across the health program has been productive of original suggestions that have proved to be invaluable. They and their pupils are responsible for many posters, booklets and charts, witty rhymes and jingles, pantomimes, contests, games and drills that have enriched and enlivened our program.

Aside from the real joy it affords them, the teaching experience has educational value for these senior girls. In addition to the information gained through the selection and preparation of the lessons to be taught, there comes to them the steadying influence of responsibility. More than this, they develop a new sweetness and dignity as a result of the contacts made in this new relationship.

Vocational Training

This part of our game possesses the further advantage of providing genuine vocational training, though of a different nature from that generally accepted as such. In the foretaste of actual teaching preparation and classroom experience that it provides, it functions most practically in the lives of those girls who enter normal school. Following, as it does in the home economics program, their lessons in child care and training, with the required background of readings and discussions of child psychology, it is, from a utilitarian standpoint, a valuable feature of our Game of Health.

From the time they enter high school, the home economics girls look forward to this experience of their senior year. Usually before school opens they borrow their Projects for the year's work, provided there is no brother or sister between 2 and 5 years old in their homes.

When school opens the real fun begins. For these little Projects must be brought to school to be weighed and measured. Charts must be prepared which will show the normal weight of each child both for the first of September and the last of May—the span of our school year. The weight is recorded on a definite date each month.

The normal line is a red line, showing vividly what should happen during the year to the child it represents, so far as weight can show. What actually happens is shown by black lines, connecting the points that indicate the real weight of the child, as it is taken, month by month.

Lugubrious tales are told by the faces of the Little Mothers if these black lines on the charts of their Projects fall short of the red ones.

This falling short is a signal to get busy. Something must be done. It will never do to have Billy come to school for next month's weighing and not be able to draw his black line where it should be!

So Little Mother, who has already begun her senior studies in nutrition and dietetics and is doing some of the required reading in child care and training, begins to investigate. What has Billy been doing or failing to do? Has he been running and playing hours at a time without resting? How much time has he spent in the open air—day and night? What has he been eating and drinking? How about his bathing and toilet habits? Has he adenoids? Do his teeth or tonsils need attention? Is he a happy, spontaneous child? How does he react to the group of Projects? These are some of the questions to which the Little Mother must find the answers.

One way of finding them is to be with Billy as much as possible. They need to know and love each other well; for if Little Mother is to be of the most possible help to Billy she must not only assist in taking care of him, but she must also be his pal.

If Billy is a borrowed Project, Little Mother must become a frequent and welcome visitor in his home. She and Billy's real mother must be understanding friends, for are they not working together for the health of the child they both love?

It may be that Billy's real mother is sometimes near tears of relief when she says laughingly to his Little Mother, "You can do more with Billy than I can." Certainly, Little Mother should be able to learn much about Billy by knowing his home life and being a part of it.

So she studies Billy—and herself. For, in this senior year her own chart is attached to Billy's. Every time an entry is made on his half of the chart, one must be made on her half also.

One of the happy experiences for which all the Little Mothers begin planning early in the year is a mother's party to which all the real mothers of the Preschool Projects and the little Projects themselves are invited.

Planning a Party

How busy the Little Mothers have to be! They divide the group into invitation and program committees, committees to provide refreshments, and to plan and arrange decorations. The health colors—red and white—are emphasized in every feature of the party. This is one of the ways the Little Mothers have of stressing the importance of fine red blood in the body and brain and of beautiful cleanliness of mind and body, and of all surroundings.

Briskly and efficiently they plan and work that all may be in readiness for their first mother's party. When the chosen afternoon arrives, all the charts are on exhibition.

When weighing day arrives, many a questioning glance from the anxious eyes of the Projects searches the telltale faces of the Little Mothers. For does not the coveted punch in their railroad

Senior high school girls in Pocomoke, Md., have children under their care for the entire school year as a part of their course in child care and training.

tickets depend upon what the scales say? You see, all the Projects are tourists on the way to Healthland. Their tickets on the Healthland Flier provide stop-over privileges at perfectly delightful resorts—Orange Valley, Spinach Green, Play Meadows and Long Sleep Mountains. The Projects know these and other attractive stations, for they have been studying the map of Healthland ever since school opened.

If all the passengers gain the necessary number of ounces each month—which is the only fare required on this road to Healthland—their tickets are punched accordingly and the entire party may proceed on the merry trip. Should a single passenger fail to pay his fare, the journey must be interrupted until proper collection is made!

The maps of Healthland, the folders and the tickets on the Child Health Railroad are among the materials that are of inestimable value in our Game of Health. They may all be obtained from the American Child Health Association.

So the Game of Health is played by these Little Mothers and their Projects until the final weighing day arrives. Occasional parties to the Projects and their real mothers; study groups when the Projects play games or when they have a simple meal together prepared by the Little Mothers and served by the Projects themselves—these and other activities speed the game along.

What fun they have had, what wholesome lessons they have learned all these happy months together. How much each one has contributed to the fine development of mind and body in all the others by their united efforts to bring about the happy meeting of the black lines with the red!

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A LUNCHROOM SURVEY

THIS activity was carried on by student teachers and pupils of the training school in a teacher's college. Some of the pupils bring lunch from home while others purchase theirs from the college cafeteria. The entire group has tables reserved in the College Commons, the same room accommodating both the college students and the children of the training school.

While the situation here differs from that in the majority of schools, the nature of the experiment is such that its success need not be influenced unduly by local conditions.

In an effort to increase the value of the noon hour to the child by providing an opportunity for practicing health habits and to utilize the lunch period as a means of stimulating social and moral growth, a survey was made of conditions as they existed at the first part of last year. Desirable standards were discussed with the student teachers and they in turn sought the cooperation of the children in their care.

Health and social training were provided for these children as a result of supervision during their lunch hour by student teachers.

Survey of Lunchroom Conditions

1. Is this a pleasant period of the day? Do the children feel any responsibility for helping to make it so? If not, what can be done about it?

2. Do the children come in quietly? Is there too little freedom? Are they disorderly? Do they line up? Do any crowd ahead in line? What remedy would you suggest?

3. Do pupils see that their hands are clean? Do they hurry through lunch without taking time to chew their food properly? When ordering from the counter, do they select their lunch wisely?

4. Are there any who show the lack of home training in table manners? Do all understand the use of knife, fork and spoon? Do some use fingers instead? Suggest a means for improving table manners.

5. Are some inclined to show off for the benefit of the college students? Does the student teacher control the conversation at the table? How do pupils respond to her efforts?

6. What social and moral qualities are being practiced by the children at noon? Are they learning politeness? Are they learning to be careful about spilling things? Do they show a respectful attitude toward the student teacher and consideration for each other? How can we provide for more practice?

7. Does each child hurry through his lunch and run out to play? Does the group leave together? What care is taken of lunch boxes? Do all participate in the games? Have you any suggestion for improvement?

Lunchroom Standards

1. *Period of Relaxation.*—The lunch hour ought to be a period of relaxation and pleasure, with a moderate degree of freedom.

2. *Entering the Commons.*—Classes should come into the Commons in a quiet, orderly fashion, each child taking his place in line or going directly to his place at the table.

3. *Rules of Hygiene.*—Pupils should learn hygienic habits, such as washing the hands before lunch, masticating their food thoroughly and choosing food wisely.

4. *Table Manners.*—Any child showing the need should receive the necessary training in table manners. This should be done tactfully and for the most part privately.

5. *Table Conversation.*—At least a part of the conversation should be general. It should also be worth while. The student teacher might take the lead in this, coming prepared with interesting story or news or requesting that on the following day each one have a riddle to tell.

6. *Ideals and Attitudes.*—The noon hour provides an excellent opportunity for practice in desir-

able social qualities, such as politeness, carefulness and consideration for others.

7. *Leaving the Commons.*—The children should leave in a group with the teacher, when all at the table have finished. They should pass at once to their room, leaving lunch boxes, taking wraps and play equipment to grounds and staying outside during remainder of noon hour. The student teacher could direct their play.

At the end of the year it was evident that while much yet remained to be accomplished, a noticeable improvement had been made.

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NEW HEALTH BOOKS AND TEACHERS' MATERIALS

IT WAS a long time ago that Benjamin Franklin said that sleep makes us healthy, wealthy and wise. All the research in this field since that time seems to confirm this belief. There was a good deal about sleep that Franklin did not understand but the reasons for getting enough sleep advanced by Franklin are apparently as near to the truth as any advanced by science.

Dr. Donald Laird of the psychological laboratory of Colgate University and his collaborator have spent several years in an investigation of sleep. Mr. Muller, in order to observe at first hand, lived for a time in the sleep laboratory, which was provided with many scientific instruments. At the end of the investigation these men preferred to publish the results in a readable[1] volume rather than in a dry book of graphs and statistics. This plan is to be recommended. Would that other investigators would adopt the same procedure. It would help to make scientific knowledge popular.

The widespread belief in the need of the adult for eight hours' sleep is confirmed by Laird and Muller. Many facts are cited to show the effect on the mind of the person who loses many hours of sleep. Perception, memory, reason and other mental activities are seriously disturbed. Tasks involving the finest kind of motor coordination become difficult, and there is a striking lack of control of emotions.

Nearly anybody would believe these statements as a result of common experience but the reader is not prepared to find that a loss of even two hours of sleep has such a serious effect. In the morning after getting six instead of eight hours of sleep more than twice as much bodily energy is burned up when doing severe mental work. The late Chauncey M. Depew must have realized this to some extent for he always took a nap beforehand when he was to attend an evening banquet.

The authors assure us that some educational institutions are already beginning to realize in a practical way the value of sleep. The University of Texas has recently arranged courses in how to sleep for 234 of its 5,200 students who are below par physically. Also Stephens College in Missouri has been urging its 600 students to nap from 1 to 2 o'clock in the afternoon. The faculty reports scholastic improvement as a result.

This book is unusually well written and is just the kind of reading that would stimulate an interest in healthful living. The teacher in the grades, high school or college will find many facts and incidents that would help to make her lessons on sleep interesting and practical.

TEXTBOOKS on psychology for the beginning student and for teachers are a drug on the market. The reviewer has had notice of three new ones during the last week. Most of them are pot-boilers. They have nothing new to recommend them. Here at last is something new.[2] Instead of dividing the mind into many compartments, such as perception, attention, emotion and thinking, the authors treat the whole child in action as a purposive being. It is through purposive behavior that the child learns. The authors take as their problem the question of how purposive behavior can be stimulated.

This is a helpful book, which will attract attention. As a teaching volume it would have proved more effective if the authors had introduced some vital problems at the end of each chapter. They might have served to make the work of the teacher more purposeful.

THIS is a title[3] that challenges. Everybody wants to know what the newer and fascinating subject of psychology has to teach us about ourselves and our world. Dr. Martin's reputation as a lecturer and teacher is sufficient to make one want to read this stimulating book. Topics covered by the chapter headings are intriguing—the fatality of habits, the question of there being a group mind, behaviorism—the latest and most debated development. Although written in a popular vein it at no point loses its scientific balance.

Dr. Martin presents a straight-on challenge to mechanism in psychology. Consciousness is real, he asserts. Some facts cannot be explained by psychology unless we assume that the person in doing certain things has foreknowledge of the results of his actions. Such a situation is present when a professor is seated in his study preparing a lecture for the next day. Alternative and choice are the basis of mental life.

Many of the chapters in this interesting volume have a bearing on mental health.

AMONG the heroes of science who have fought a winning fight against disease and earned the sincere gratitude of mankind is Dr. Edward Livingston Trudeau. He was great as a physician but even greater as a man. To read his life[4] is to get some of the vision and inspiration which have fired great souls. No other life could be more helpful to the youth who wishes to learn great lessons of heroism and some of the facts associated with the conquest of one of the most dreaded diseases of mankind; namely, tuberculosis. Miss Hallock and Dr. Turner have done their work well.

IN this rapidly changing world the problem of bringing up children is serious. Human nature remains essentially about the same as ever but a changing background brings into the foreground new duties and responsibilities for those who would guide children. Into this new world in which unquestioned obedience has been rapidly displaced by freedom, Dr. Swift presents to the parent and teacher a readable and practical volume, "The Psychology of Childhood."[5] It shows a comprehension of the most pressing questions of the hour relating to child training and a comprehension of mental health problems.

Dr. Swift adopts a critical attitude toward the orthodox conceptions of intelligence and finds many facts to bear out his belief that genius does not necessarily show itself in early life. Cases like those of Grant and Darwin are cited. His treatment of the question of the development of personality is helpful. This book is one that could be read by the average parent or teacher with profit.

1. Sleep—Why We Need It and How to Get It. By Donald A. Laird and Charles G. Muller. Pp. 214. John Day Company, New York, 1930.

2. Psychology for Teachers. By Ellsworth Collings and Millbourne O. Wilson. Pp. 468. Charles Scribner's Sons, New York, 1930.

3. Psychology—What It Has to Teach You about Yourself and Your World. By Everett Dean Martin. Pp. 296. W. W. Norton Co., Inc., New York.

4. Edward Livingston Trudeau. By Grace T. Hallock and C. E. Turner. Pp. 168. D. C. Heath & Company, Boston, 1929.

5. By Edgar James Swift. Pp. 431. Appleton, New York, 1930.

New Books *on* Health

Reviewed by
Morris Fishbein, M.D.
and Others

HARVEY W. WILEY—AN AUTOBIOGRAPHY

By Harvey W. Wiley, M.D., Cloth. Pp. 339. Price, $5. The Bobbs Merrill Company, Indianapolis, 1930.

IF it had not been for such able crusaders as Dr. Harvey W. Wiley, the American people would have had little protection against the exploitation of adulterated foods and poisonous drugs. Now Doctor Wiley tells the story of his life. Always a fearless fighter in the people's cause against powerful enemies among politicians and unscrupulous food manufacturers, he relates his experiences which cover the twenty-nine years that he was chief chemist of the Department of Agriculture in Washington. Here is an interesting account of his dramatic "poison-squad" experiments in which volunteers among his own bureau employees were fed foods containing preservatives to ascertain if they were injurious to health. Of course, his accomplishments are epochal, but the story of his fight is what holds the reader's attention, for struggle rather than success is dramatic. A reading of this book provides an insight into one of the outstanding personalities of our time. Doctor Wiley humorously and modestly tells of his boyhood, of his college days, the episodes of his government service and of his activities as director of the Bureau of Foods, Sanitation and Health of *Good Housekeeping Magazine*. Every American reader will be interested in the life of the man who led the fight to make the manufacturers put truth on their labels so that the consumer might know.

THE BIOLOGICAL BASIS OF HUMAN NATURE

By H. S. Jennings, Henry Walters Professor of Zoology and Director of the Zoological Laboratory in the Johns Hopkins University. Cloth. Price, $4.00. Pp. 384, with 51 illustrations. New York City: W. W. Norton & Company, Inc., 1930.

UNTIL recently biology was considered to be an erudite science dealing with fishes, frogs and newts and with little or no relationship to the life of man. Today, we are looking more and more to biologists for the answers to the many questions that disturb the human mind.

Professor Jennings writes so that any intelligent reader can understand. He tells the fundamental facts of heredity and development; takes up the application of these facts to social problems; speculates as to what the possibilities are in the future, and what evolution is likely to do for man. He is concerned with the question of whether or not diseases and acquired characters are inherited, with the effects of alcohol and various poisons on the body, with the possibility that eugenics have for mankind, and with numerous other questions that should concern all of us. He recognizes as extremely desirable a cessation of the propagation of defectives, pointing out a way in which feeblemindedness is inherited. He emphasizes also the slowness of eugenic action and the need for more research if such action is to be hastened.

One of the most interesting chapters deals with the biologic basis of marriage, and he answers biologically such advanced thinkers as Bertrand Russell. Thus he considers the monogamous family as constituted at present to be the proper system scientifically for man as he is today, and that the system is not likely to change in the near future.

This is one of the most thought provocative works that has been made available for the general reader. It is a scientific book-club selection and every one who wishes to discuss these subjects intelligently must be familiar with its content.

CHILD ADJUSTMENT

By Annie Dolman Inskeep, Ph.D. Cloth. Pp. 427. Price, $3.00. D. Appleton and Company, New York, 1930.

THE aim of this book is to point out how the child's body, mind and emotions differ from those of an adult. It traces the development into the adult stage and shows how children should be cared for during their school years. The biggest problems of the whole span of life are concerned with the proper adjustments of the normally growing child to his complex environment. The book is about children but is dedicated to every one who touches the life of a child.

The author's conception of education is that it consists of guiding growth and development. Doctor Inskeep is a child psychologist and has gathered here in one volume a series of lectures given to teachers attending the University of California summer session. She advises frank thinking about problems of adolescence, when "the sins of the fathers and the faults of environment do the most damage." This period of great physical and emotional strain forms a basis for an extensive consideration of the child's emotional health. The author explains how measurements of intelligence are made and the intelligence quotient is formulated. She advises about hygienic measures for physical maladjustments. Diagnoses are made concerning variations from the normal in child behavior and remedial advice is given.

The book can be used for extensive home study if the reader utilizes the lists of questions and selected references at the end of each chapter. "Child Adjustment in Relation to Growth and Development" will appeal to all parents and to those who work with children.

THOSE TEETH OF YOURS

A Popular Guide to Better Teeth. By J. Menzies Campbell, L.D.S., D.D.S., F.R.S.E., F.I.C.D. Cloth. Price 3s. 6d. net. William Heinemann, Ltd., London, 1929.

POPULAR interest in the teeth has been greatly enhanced since the acquisition of knowledge indicating that the teeth are not merely ornamental and useful in eating but that they bear an intimate relationship to the body as a whole, and that diseases of the teeth may have far-reaching effects. Furthermore, it is now realized that the development of the teeth and their hygienic condition depend largely on that of the body as a whole. Tooth hygiene is intimately bound with general hygiene; diet is important in the structure of the teeth and in prevention of decay.

The author of this book has lectured on this subject extensively to public audiences in England and he has a thorough familiarity not only with dentistry but with the various aspects of the subject that have been indicated. Thus various chapters in his book cover dentistry, anatomy and physiology of the teeth, tooth decay, pyorrhea, extraction of teeth, children's teeth and teeth in relationship to general health. The book includes a chapter on dentistry as a career and is unquestionably one of the most easily read and best prepared books in its field.

Questions *and* Answers

If you have a question relating to health, write to "Questions and Answers," HYGEIA, enclosing a two-cent stamp. Questions are submitted to recognized authorities in the several branches of medicine. Diagnoses in individual cases are not attempted nor is treatment prescribed.

Diabetes and Tuberculosis

To the Editor:—Is it possible to use insulin in the treatment of diabetes when the patient is suffering with tuberculosis? He has been in bed for five months, and both diseases have become worse during that time.

C. E. D., Illinois.

Answer.—Yes, insulin may be used, and if the diabetes is at all severe it must be used, and used right. Unless the diabetes is mild, the patient cannot utilize food enough without insulin to enable him to overcome his tuberculosis. It is possible for one who has moderately severe diabetes, advanced tuberculosis and pernicious anemia to take insulin and to show steady improvement in every way.

Such a patient should of course be under the guidance of a physician who thoroughly understands the use of insulin.

Snoring

To the Editor:—We are trying to obtain some data on snoring. If a stopped-up nose causes or aggravates snoring, will the clearance of the nose cure it? What are the accepted methods or remedies to effect this clearance of the nose?

F. S. N., New York.

Answer.—Snoring may be due to a number of factors, but the principal one is the vibration of the soft palate. Intranasal obstruction sometimes causes snoring which may be more of the character of labored breathing than vibration of the soft palate.

On the other hand, when there is nasal obstruction and the person is forced to breathe through the mouth, particularly when he is lying on his back, the soft palate falls toward the posterior pharyngeal wall and then often vibrates loudly. If he lies on his side or on his abdomen, the soft palate and uvula fall away from the posterior pharyngeal wall and there is much less tendency to snoring. While the nasal obstruction is an important factor, snoring is avoided if the person does not lie on his back.

If the nasal obstruction is due to pendulous enlargements of the inferior turbinate, especially of the posterior end, operative removal of the enlarged parts may be of assistance. If the uvula is very long a portion may be removed. If there is rhinitis with swelling which causes considerable nasal obstruction when the person is lying down, galvanocautery of the mucous membranes of the inferior turbinates often improves the breathing space.

The posture during sleep, however, seems to be so important that if a person can be taught to sleep on his side, snoring is in many instances greatly diminished if not actually prevented. In some cases, however, proper posture, intranasal manipulations of various kinds, or even the amputation of a very long uvula will not suffice to eliminate the noise.

Measles Immunity

To the Editor:—Is it possible to have German measles more than once? After an attack of measles (not German measles), is one immune to any kind of measles thereafter? M. L., New York.

Answer.—German measles is one of the contagious diseases which is, as a rule, self-protective; that is, a person who has had an attack is protected for life against another attack. There are exceptions, however, just as there are in measles and scarlet fever of which well authenticated second attacks have occurred.

Measles and German measles are distinct diseases. An attack of one of these diseases does not protect the individual from an attack of the other.

Mechanical Refrigerators

To the Editor:—In my home we have a mechanical refrigerating plant supplying about eighty-five apartments from one central unit. As I have a sensitive membrane in throat and bronchial tubes and cannot sleep with the windows open so as to have abundant ventilation and as the kitchenette is in rather close proximity to my sleeping room, I should appreciate your opinion as to the degree of safety that I may expect. This inability to have the windows open so as to have free circulation is especially marked in winter. M. D., Illinois.

Answer.—The mechanical refrigerator in the apartment mentioned is a system that utilizes carbon dioxide for cooling and brine for distribution. There would, therefore, be no danger for the tenants in a building so equipped.

Remedy for Seasickness

To the Editor:—Can you recommend a remedy for seasickness? On my last ocean voyage, I took Seoxyl, which helped me, but in a few days the gold in my rings and a chain around my neck turned black and I was afraid to take more.

E. W. D., Massachusetts.

Answer.—Seoxyl was inquired into by the Bureau of Investigation of the American Medical Association four years ago. The formula as given then comprised five drugs, but two of these were stated to be used in homeopathic doses, which means, of course, that they had no physiologic effect. Another drug is known to be without effect when taken by mouth. This leaves only two of the ingredients to be considered in connection with the activity of the preparation; namely, the salt of cerium, which has been considerably used for nausea, and the salt of atropine. Both of these drugs have been used for many years in the treatment of seasickness, but like all other remedies for that condition are successful only in a limited number of cases; in others, the treatment fails entirely.

One of the most recent contributions to the literature on this subject is an article on the use of sodium nitrite in seasickness, which was published in *The Journal* of the American Medical Association for April 14, 1928.

Use of Anesthetic in Dentistry

To the Editor:—When a dentist extracts a tooth, he first injects novocain into the gums to make the extraction painless. If he injected novocain before drilling in a tooth, would that eliminate the buzzing in the head produced by drilling? E. H., Illinois.

Answer.—A local anesthetic applied to the inside of the tooth, that is, to the pulp, deadens the sensibility for only a short time and extent. It would not eliminate the buzz in the head, which is of purely mechanical origin. Moreover, it is considered unwise by many dentists to deaden the pain sense in the nerve completely, as the sensitiveness of the tooth is an important guide to the dentist in knowing just how far and where to drill.

Insurance for Tuberculosis Nurses

To the Editor:—In HYGEIA for November, 1929, you included an article on phthisiophobia, written by John M. Gibson. I was much interested in the article and used it as a basis for a morning sermon, because phthisiophobia is prevalent in this vicinity owing to the fact that the county tuberculosis sanatorium is located nearby. One of my parishioners, who was formerly a nurse in the sanatorium but who has since resigned, informed me later that any one who spends more than two and one-half years nursing in a tuberculosis sanatorium is considered an undesirable risk by insurance companies. Is this a fact, or is this another form of phthisiophobia?

A. W. S., New York.

Answer.—One of the large insurance companies to which this inquiry was submitted replies as follows: "Our company does both a standard and substandard business. Under the latter category we issue policies with an extra premium to cover certain impairments which do not allow of issuing standard insurance. We also charge an extra for hazardous occupations. The hazard may be due to liability to accident or liability to disease.

"While we recognize the fact that nurses in tuberculosis sanatoriums probably take special care in order not to contract disease, there is a certain hazard which is shown by an increased mortality in our past experience. We accept nurses under a five year advance in age. We do not allow them disability benefits but we do allow a waiver of premium with an extra charge and double indemnity in case of accident. Housekeepers and superintendents in these hospitals we accept without advance in age and with disability benefits and double indemnity benefits. Of course, these remarks apply to one who has no health impairments, past or present.

"We do not know the source of your information that any one who has spent more than two and one-half years nursing in a tuberculosis sanatorium is considered an undesirable risk. This is not a fact as far as this company is concerned. If the insured changes her occupation and does so permanently so far as working in a tuberculosis institution is concerned, we eliminate this extra charge."

External Hemorrhoids

To the Editor:—Which method of treating external hemorrhoids do you consider best: surgical treatment, electrocautery or ambulant-syringe injection?

J. C. C., Michigan.

Answer.—Any of the methods of operating for hemorrhoids may be used. Usually in the case of external hemorrhoids it is necessary only to open them to allow the blood to escape and then let the wound heal of itself. With internal hemorrhoids, it is a question of preventing hemorrhage and removing the pile. Which method is best to use depends on the conditions in the individual case and should be determined by a competent physician.

X-Ray Apparatus; Tapeworm

To the Editor:—1. What are all the disorders that may be detected by the x-ray? 2. What could cause small holes to come on the skin of the face? These are not enlarged pores. 3. What could cause pain in the eye sockets? I have not been using my eyes any more than usual. I don't notice any strain while reading. The pain is always at night. 4. What are the symptoms of a tapeworm? What is the treatment? E. R., Tennessee.

Answer.—1. It would be impossible within the limits of this department to enumerate all disorders that may be detected by means of the x-ray apparatus; new ones are being constantly added. In the early days of its use the skiagrams (shadow pictures) were used for little else than to detect displacements and deformities, but since it was discovered that mineral substances which cast shadows when the x-rays are passed through them can be introduced into the cavities of the body with safety, the possibilities of the x-ray have been enormously increased. When a meal is taken with which bismuth or barium is incorporated, the course of the meal from the stomach through the bowels can be followed accurately and in many cases important evidences are obtained of the conditions present in the abdomen. Certain salts of iodine and bromine can be injected directly into the blood vessels, and thus cast a shadow wherever they are present. Conditions of the gallbladder, including gallstones, can be studied because in many cases gallstones themselves do not cast shadows, while the salt excreted into the gallbladder does do this. Every cavity in the body may be studied by use of x-ray apparatus.

2. It would be idle for us to guess the cause of the small holes in the skin of the face. It may be an enlargement of the openings of the gland ducts.

3. Many conditions might cause pain in the eye sockets.

4. The symptoms of tapeworm are varied. Often the presence of a tapeworm produces no symptoms whatever; at other times there may be considerable distress, some abdominal pain, nausea, diarrhea and sometimes anemia. Occasionally the appetite is ravenous, and when it is discovered that tapeworms are present in women and nervous patients mental depression and even hypochondria may result. One form of tapeworm which infests fish may occasionally cause a severe and even fatal form of anemia. None of the symptoms of tapeworm are peculiar to that disease but may come from other causes.

Household Refrigeration

To the Editor:—Will you kindly refer me to available information concerning the value of proper household refrigeration in relation to health. I am particularly desirous of having authoritative statements concerning the effect left-over foods might have on persons suffering from various forms of indigestion.

T. S. W., District of Columbia.

Answer.—A good source of information on this subject is Dr. Pennington's eleven pamphlets issued by the National Association of Ice Industries, 163 West Washington Street, Chicago. Bulletin No. 5, "The Care of the Child's Food in the Home," and No. 6, "Why We Refrigerate Foods" should be of greatest service.

A second source is a small book "Food Preservation in Daily Life" published by the Frigidaire Corporation, Dayton, Ohio. This has excellent illustrations showing food spoilage at varying temperatures for different classes of foodstuffs. A briefer but interesting booklet, "The Effect of Refrigeration Temperature on Food and Health," is published by the Kelvinator Corporation, Detroit.

Two pertinent articles are "Suggestions for the Prevention of Food Poisoning" by Dr. Charles Thom, *American Food Journal*, November, 1923, and "Food in the Household Refrigerator" by Brookhurst and Von Arsdale, in the *Nation's Health*, September, 1924.

Erosion of Tooth Enamel; Receding Gums

To the Editor:—Would you kindly tell me the cause and cure of erosion of teeth enamel? Also the cause and cure of receding gums? I have receding gums only on those teeth that have erosion. I eat natural foods and no sweets. I am in my forties but the erosion started when I was 33 and has been going on ever since, attacking new teeth. I am in despair as I used to have such lovely teeth.

R. W., New Jersey.

Answer.—The cause of erosion is not known. We know that it must be an acid, but why an acid attacks certain locations on the teeth and not others, we do not know. The supposition is that small glands in the lips lying against these surfaces secrete the acid, because we seldom or never find erosion on other surfaces of the teeth. The only cure known is to fill the eroded places when they become too deep.

Receding gums in connection with erosion are probably from the same cause. Gums are sometimes made to recede by too vigorous cross-brushing of the teeth, bristles forcing the gums away from the teeth. To prevent this the upper teeth should be brushed downward and the lower teeth upward.

Second Wind

To the Editor:—What is meant by your second wind?

A. P., Pennsylvania.

Answer.—By second wind is meant essentially the relief from labored breathing as well as relief from some sense of fatigue in the course of more or less violent exercise. The athlete may be freed, more or less suddenly, from the sensation of shortness of breath and may continue to run with greater comfort at the previous or even at a faster rate.

Pembrey and Cook found the carbon dioxide content of the lung air higher before than after the establishment of second wind, indicating perhaps that a more "steady state" has been attained in the sense of either a lessened production or, what seems more likely, a more rapid removal of carbon dioxide or lactic acid. As a result respiration would be slow, vigorous and deep and the individual would be more comfortable.

The same authors found a close association in time between the onset of sweating and the occurrence of second wind, but no correlation between the onset of second wind and changes in pulse rate or blood pressure. An increased oxygen supply (vasodilation) to the contracting muscles, leading to their more rapid recovery as a result of removal of the lactic acid, might be a factor in the establishment of second wind.

Senile Dementia

To the Editor:—My husband, 68 years old, has been in a paranoid mental state for a year. He retired from business about four years ago and we went to Florida for the winters, returning North in the summer. A year ago he took a sudden impulse to leave Florida just after we had arrived, because, he said, he had reason to believe that he was going to be kidnaped by the Ku Klux Klan. When nothing could stop him, we drove North and we took a house. We had not been settled there more than two weeks when he insisted that we leave there and go some place else. He had many suspicions there and I did not know what to do, so I prevailed upon him to go to a sanatorium. After five months there he grew more distrustful and, on the doctor's advice, we moved to another state, where he had been in business and knew every one. The doctor thought he would not have so many suspicions. He has as much of a mania for working as he does about other things. He is working for a firm with which he used to be connected. He goes to extremes in his work and does many things that are unnecessary. He seems to be all right around town in the daytime, but at night he comes home and locks all the doors, draws the blinds, and sits off in a corner where it would be impossible for any one to see him through the windows. I am wondering how this will terminate. He sleeps and eats like a healthy child, but his mentality is low. Only in his work he sometimes seems to show an unnatural interest. Of course, he will not go back to Florida, even though we have a home there. Now I do not think I can possibly get him to go to a sanatorium of any kind again unless it would be by force. His general attitude toward me and my daughter is kind, but he seems perfectly void in any conversation. He was formerly a man of fine personality, and now that same personality has the public guessing. Everybody knows that he is no longer the same man, but they do not know what the cause is and I have said nothing. It is a great strain on me and I thought you might give me your opinion of the situation. I must know what the termination might be.

C. L. W., Indiana.

Answer.—The story as told suggests that this man is suffering from a mental breakdown consequent on old age and probably with hardening of the arteries. The physicians at the sanatorium where he spent some months could probably give a more definite opinion since they had him under observation for a considerable time.

The outlook for recovery, if the conclusion suggested is correct, is not good and one would expect that he will slowly become less active and less capable of any kind of business.

In many such instances, the best course for the welfare of the patient is care in a special hospital. Though they may object to going, they do not usually suffer as much under the quiet environment as they do when exposed to the stimulations and excitements of the every-day world. If the restless activity and fear of harm should lead to greater degrees of apprehension, it may be not only desirable but even necessary to insist on such hospitalization.

X-Rays and Sterility

To the Editor:—I have been employed by a doctor for three months, and I am learning to operate the x-ray machine. We average about a dozen six-minute treatments a week and about the same number of pictures. We seldom have a fluoroscopic examination. I wear a lead apron over the front of my body during x-ray work. Is there any danger whatsoever to a girl operating an x-ray machine? Is there danger of the development of sterility? How soon would it occur? Do you think it advisable for me to continue this work?

M. T., Oklahoma.

Answer.—X-rays are energies of great power, and unnecessary exposure should be eliminated. Two factors of importance are to be considered. One is the frequency and the amount of x-ray exposure, and the other is the protective facilities. The young woman is quite right in exercising all caution. It is impossible to state how much exposure she is actually receiving, because she does not mention a cubicle or housing of the switchboard and the operator. This is of prime importance. A practical test should be to darken the room completely, cover the x-ray tube so that the radiation from the filament does not illuminate the room, and then use the fluoroscopic screen in various parts of the room, more particularly in the region occupied by the operator. If the screen fluoresces even to the slightest degree, it is a hazard.

Sterility is liable to be produced if sufficient radiation is absorbed by the individual. The minimum amount is not known. However, as a working basis, the less exposure to x-rays, the less liability to bad after-effects.